

THE
EAST-INDIA
NAVIGATOR'S
DAILY ASSISTANT.

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DAILY ASSISTANT

FOR THE

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THE
EAST INDIA
NAVIGATOR'S
DAILY ASSISTANT;

WITH THE
New METHOD of computing the
LONGITUDE,

DEDICATED BY PERMISSION,
TO THE
Honourable the COURT of DIRECTORS
OF THE
United Company of MERCHANTS of ENGLAND.

TRADING TO THE
EAST INDIES.

By R. B I S H O P.

L O N D O N:

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MDCCLXXIII.

THE

EAST INDIA

NAVIGATION

DAILY ASSISTANT

WILL

NEW METHOD OF

NAVIGATION

DEVELOPED

TO

THE

NAVIGATION

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NAVIGATION

TO THE
GENTLEMEN
WHO ARE EMPLOYED
In the INDIA SERVICE,
EITHER IN HIS MAJESTY'S
OR THAT OF THE
Honourable East-India Company.

GENTLMEN, TO YOU I RECOMMEND THE FOLLOWING
DAILY ASSISTANT.

I HERE present you with my own observation and remarks, and also with those of several Gentlemen who are well skilled in those matters.

You must know that in my youth when
I was employed in the West-Indies, in his
a Majesty's

Majesty's Service, I found there were no charts then in being which could give any tolerable insight into the navigation of those Seas. It was therefore necessary that something more correct should be attempted. After twenty-two years practice, I found I had got materials sufficient to publish my charts of the Gulph and Windward Passages, which I did in the year 1761, dedicated to the Lords Commissioners of the Admiralty, and by them approved.

In the year 1762, I procured leave from the Lords of the Admiralty to go abroad, merely to perfect myself in the knowledge of the navigation of the West-Indies, and their Lordships ordered me a passage in his Majesty's ship, Deptford, Capt. Digges.

When

When I arrived at Jamaica, Commodore Forrest thought proper to detain me as a Pilot and appointed me Master of his Majesty's ship Richmond, I served in her as Master and Pilot. We went down the Old Straits of Bahama, and back again to the East end of Cuba, where we met his Majesty's Fleet under the command of Sir George Pocock, which Fleet was conducted safe off the Havannah. And after the reduction of that place, I came to England in his Majesty's ship Namure, on board of which ship Sir George hoisted his Flag. My chief design in coming home was to publish a chart of the Old Straits of Bahama, with directions; and how the Fleet was carried down.

In our passage home, we were several weeks in and about the channel, and were at a loss
both

both as to the Latitude and Longitude. Afterwards I published my chart of the Old Straits of Bohama, the dedication of which was accepted by Sir George Pocock, and being favoured by the Gentlemen of the Parishes of St. Andrew-Hubbert, and St. Mary's at Hill with the use of the Steeple, I built a temporary observatory there, and improved myself in computing the Longitude by celestial observation. But not contented, I procured a second leave from the Lords of the Admiralty, and was favoured with a passage to Jamaica by Mr. Long in one of his ships, in which I practised by the Tables published by Mr. Maskelyne; but the process being difficult, I could not depend upon my operations, and was obliged to repeat the calculations a great many times over. On my arrival in England, by practising the observations that I took when abroad, I thought
of

of constructing a formula to save trouble, and found it would be more certain, and especially if two persons were to compute at one time. I communicated my opinion to Mr. Maskelyne, then Royal Astronomer, who assisted me and approved of my plan, which after inspection was favoured with the approbation of the Honourable Board of Longitude.

I think it necessary to say something concerning the instruments which are in use at present, viz. Hadley's Quadrant so called, and a Sextant. These instruments, I think are the best, for taking the distance of the moon from the sun or stars. But you have two or three days more to take observations by the Sextant than by the Quadrant, the arch being larger. The Tangent screw fixed upon the Index is not wanted till the two objects which are to be observed by are brought

b

near

near each other. And likewise to be fitted with a screw that is to rectify the sight Vane, in order to come at the true line of direction upon the Horizon glass.

I have for my own satisfaction, and to make improvements, purchased a Quadrant of Mr. Bird's making, which I take to be one of the best. This I make use of as a standard for the rectifying others by; but this instrument being fixed with a telescope that inverts the object, I found it very difficult to instruct Gentlemen to observe by it.

I therefore set about constructing a telescope which does not invert, and in comparing it with the other telescope I found all objections removed. This is of singular service in the adjusting the instruments. The telescope magnifies four times, and consequently you refine the edge of the Sun and moon.

moon four times. There is a slide fixed to the telescope to take off the glare of the sun or moon; this slide has four or five pieces of stained glass fixed in it of different colours which you may suit according to the brightness of the sun or moon.

The telescope is fixed on the sight vane, and when the Index is at O upon the arch, then by looking through the telescope, you may see the center of the object-glass in the true line of direction by only screwing the sight vane in or out till you see both object of a like brightness, then are you sure you have the true line of direction.

But when you want to adjust by the sun or moon, the best way is to look into Ephimeres for the semi-diameter; then set your Index so far forward upon the arch as to make the allowance for it, and look directly at the
sun.

sun or moon, having the slide fixed; and if you see the object by reflection, just touch the under part of that seen direct, then is your instrument properly adjusted as to that part; but if it is not rightly adjusted, the two images will be open or shut, then you must adjust it by the Leaver that is at the back of the Index glass which has a communication with it; but it is necessary that the Index should be moved up and down two or three times to find whether the object seen by reflection goes up perpendicular with the object seen direct, if not, then are you to apply a turn-screw.

N_a.B. There are two screws for rectifying the Horison glass, the one before, and the other behind (besides the two that fix the glass upon the stool;) if you unscrew the one that is behind the glass a little, and screw up that which is before, it will cause a reflecting

flecting object to go to the right, and contra, will be the other way, taking care to keep the screws tight, and with a little practice it will become familiar. I have provided a place on purpose to shew the manner of rectifying the Quadrant, and also of taking the distance of the objects.

After you have rectified your instrument, and intend to take the distance betwixt the sun and moon, I would advise you to take out the telescope, and put in its place a piece of brass which has a pretty large hole in the center of it, which will answer to the center of the object glass of the telescope when fixed; and by letting down one or more of the shade glasses which are of different colours, and fixed upon the outer limb of the instrument, and when your index is at **O** on the arch, you then holding your instrument on a
c straight

straight line between the sun, moon, or star, and at the same time looking direct at the sun or moon, you may bring the brightest object seen by reflection towards the other, and when you have so brought it, if it be an observation of the sun and moon, and the moon be too glaring, then you must make use of the slide that is upon the sight vane, and turning the tangent screw gently, and keeping the object so as they may just touch each other's edge, and by making use of the glasses of the sight vane, as you will see the edges of the object more distinctly, by this method you may with practice make a very nice observation.

The same method you may take with the moon and star, only you will have no occasion for the slide of the sight vane, and for better convenience I have constructed a
handle

handle that may be poised upon one hand, so that the other may be at liberty to attend the tangent screw. But I found upon tryal that by screwing the handle on the instrument, it put the glasses out of their position, I therefore made a loose joint to the handle which I find answers the purpose I intended.

This method of fixing the instruments is of singular service in observing upon the land, by having a little treacle in a saucer which makes a good horizon. I make it my common practice to take observations by the sun for the latitude which I find very true and just, as I am never out above one or two miles, and very seldom the later, and very often I observe by the back way of Hadley's Quadrant, if the angle be above 120° .

It

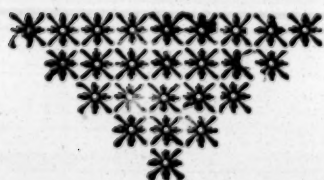
It will be necessary to explain the method how I adjust the back observation; I have a very exact mark of 90° upon the land on the Surry side, which I take by the fore observation; then turning the Quadrant, and looking through the sight of the back glass, I set the glasses to the same distance; but if I cannot see those marks, I then apply to my treacle, and watch when the sun is going to quit 90° , and then immediately I turn it and see if it comes in properly the back way; if it does not, you must rectify by the leaver, that is at the back of the horizon glass, seeing that the back observation takes all angles from a Quadrant to a semi-circle, and that the numbers directed to by the Index express the supplement to 180° or a semi-circle, it is evident that when the Index stands at the beginning of the division, the angle will be then 180° compleat; wherefore if the
glasses

glaffes are truly fixed, the object feen by reflection will be diametrically oppofite to that feen by direct view, and if you fix a telescope to the back obfervation, then will your back object go direct, and your fore one be inverted. So much for the Quadrant and Sextant.

To take obfervation by the treacle, move your index until the lower part of the fun's image by reflection come in contact with the upper part of the fun's image feen in the treacle, then you muft allow for the femi-diameter of the fun fubtracting refraction.

N. B. You muft underftand that this method of obferving is exactly double to that which is obferved by taking the latitude by the horizon; and the only difference

ference is, viz. by the horizon you allow for the dip according to the height you are from the sea. You are only to take half the degrees and minutes upon the arch, and proceed by adding the semi-diameter less by the refraction, and the same as you would do at sea; and by practising this method, I doubt not but it will be of great service.



Computations for finding the Longitude by Observations taken

Time by Watch	Dist. $\odot$ or * & $\odot$	Altitude $\odot$ or *	Altitude $\odot$
$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$	$^{\circ}$ $'$	$^{\circ}$ $'$
Mean	Mean	Mean	Mean
For rectifying the Watch Observ'd at.....			
Altitude $\odot$ lower limb		Watch	by
Suppos'd Apparent time.....		.....	
Latitude comp'd.....		Longitude comp'd.....	
- From go. Co Lat.		+ or - in time = p. 6 th	
Time Observ'd by Watch.....		.....	
Suppos'd Apparent time at Greenwich.....		.....	

By Ephemer. For Computing the Apparent time. Lf. 1st Month

$\odot$ Declination	$^{\circ}$ $'$ $''$	D° $^{\circ}$ $'$ $''$
D°		
Difference in 24 hours	.....	= .....
$\odot$ Declination at the time of Observation.....	.....	.....
+ or - from go. is Polar Distance.....	.....	.....
Altitude $\odot$ lower limb Observ'd.....	.....	.....
- Dip. and Refraction.....	.....	= .....
Altitude $\odot$ lower limb corrected.....	.....	.....
+ $\odot$ Semidiameter.....	.....	.....
Altitude $\odot$ center corr'd.....	.....	.....
- From go. is Zenith Distance.....	.....	.....
Zenith Distance.....	.....	.....
Polar Distance.....	Ar. Comp ^t Sine	.....
Co Latitude.....	Ar. Comp ^t Sine	.....
Sum.....	$^{\circ}$ $'$	.....
$\frac{1}{2}$ Sum.....	=	Sine
$\frac{1}{2}$ Sum - Zenith Distance = .....	.....	Sine
Sum.....	$^{\circ}$ $'$	.....
$\frac{1}{2}$ Sum is Co. Sine.....	.....	.....
Doubled.....	2	$^{\circ}$ $'$ $''$
Horary L	p. 6 th	=
Time by Watch when the Altitude $\odot$ was taken.....	.....	.....
Difference is Watch.....	by	.....

To Compute from the Observations above.

Time by the Watch when Dist. $\odot$ was taken.....	$^{\circ}$ $'$ $''$
Watch being.....	by.....
Apparent time at taking the Distance $\odot$.....	.....
+ or - for Longitude from Greenwich comp'd.....	.....
Apparent time at Greenwich.....	.....
Mean of the Observ'd Altitude $\odot$ or *.....	$^{\circ}$ $'$ $''$
+ Semidiameter less by Dip.....	.....

By Ephemer. Computations continued. Lf. 4th Month

Hor ^l Par. $\odot$ at.....	Prop ^l Logarithm.....
At.....	D°
Prop ^l Logarithm.....	$\frac{1}{2}$ Difference.....
Prop ^l part + or -.....	D° is Prop ^l part.....
Prop ^l Logarithm.....	= Hor ^l Parallax.....
Distance $\odot$ or * and $\odot$ Observ'd.....	.....
+ or Semidiameters $\odot$ and $\odot$.....	.....
Distance of the $\odot$ or * and $\odot$ centers.....	.....

By the New Tables of Refraction & Parallax.

Dist. $\odot$	Alt ^d *	Alt ^d $\odot$	Reduction	Corr Log ^m	Differ ^a of Reduct ⁿ	Differ ^a of Corr Log ^m or Arch of Corr Log ^m
$^{\circ}$	$^{\circ}$	$^{\circ}$	$'$ $''$			

By the Table of Proportional Parts,

Reduction	Corr. Logarithm
Differ ^a for Min. ⁿ of Alt ^d	Differ ^a for Min. ⁿ of Alt ^d
Min. ⁿ Reduc ⁿ Alt ^d Reduc ⁿ	Min. ⁿ Reduc ⁿ Alt ^d Reduc ⁿ
If 60: :: : "	If 60: :: : "
If 60: :: : "	If 60: :: : "
If 60: :: : "	If 60: :: : "
Difference.....	Difference.....
First Reduction.....	First Corr Log ^m
Gives True Reduc ⁿ	Gives True Corr ^d Log ^m
Horis ^l Parallax.....	or Arch.....
Above 5.3. by	Paral. Log ^m Tb
Corr Logar ^m bring down.....	.....
Sum or Diff. by Paral. Log ^m	=
True Reduc ⁿ bring down.....	.....
Is the Corr of the Distance.....	.....
Distance of the Centers bring down.....	.....
Distance cleared of Refract & Parallax.....	.....

Incr^s
Centra

Computations for finding the Longitude by Observations taken

Time by Watch	Dist. $\odot$ or $\star$ & $\odot$	Altitude $\odot$ or $\star$	Altitude $\odot$
$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$
Mean	Mean	Mean	Mean

For rectifying the Watch, Observ'd at
 Altitude $\odot$ lower limb Watch by
 Suppos'd Apparent time
 Latitude comp'd Longitude comp'd
 - From g° Co. Lat. + or - in time = p. 6.
 Time Observ'd by Watch
 Suppos'd Apparent time at Greenwich

By Ephemeris For Computing the Apparent time If 1st Month

$\odot$ Declination D°
 Difference in 24 hours =
 $\odot$ Declination at the time of Observation
 + or - from g° is Polar Distance
 Altitude $\odot$ lower limb Observ'd
 + $\odot$ Semidiameter less by dip & Refraction =
 Altitude $\odot$ center corr'd
 - From g° is Zenith Distance
 Zenith Distance
 Polar Distance Ar. Comp't Sine
 Co. Latitude Ar. Comp't Sine
 Sum
 $\frac{1}{2}$ Sum = Sine
 $\frac{1}{2}$ Sum - Zenith Distance = Sine
 Sum
 $\frac{1}{2}$ Sum is Co. Sine
 Doubled 2
 Hourly $\angle$ p. 6. =
 Time by Watch when the Altitude $\odot$ was taken
 Difference is Watch by

To Compute from the Observations above.

Time by the Watch when Dist. $\odot$ was taken
 Watch being by
 Apparent time at taking the Distance $\odot$
 + or - for Longitude from Greenwich comp'd
 Apparent time at Greenwich
 Mean of the Observ'd Altitude $\odot$ or $\star$
 + Semidiameter less by Dip
 Altitude of the $\odot$ or $\star$ corr'd
 Mean of Observ'd Altitude $\odot$
 - Semidiameter less by Dip
 Altitude of the $\odot$ or $\star$ corr'd
 Mean of Observ'd Altitude $\odot$
 - Semidiameter less by Dip
 Altitude of the $\odot$ or $\star$ corr'd
 Mean of Observ'd Altitude $\odot$

By Ephemeris Computations continued If 4th Month

Hor^l Par. $\odot$ at Prop^l Logarithm
 At D°
 Prop^l Logarithm 1st Difference
 Prop^l part + or - D° is Prop^l part
 Prop^l Logarithm = Hor^l Parallax
 Distance $\odot$ or $\star$ & $\odot$ Observ'd
 + or - Semidiameters $\odot$ & $\odot$
 Distance of the $\odot$ or $\star$ and $\odot$ centers

Computation of Refraction by M^r Lyon's Table 1st

Alt. & corr'd T.N. D° T.N.
 Alt. $\odot$ D°
 T.N. 1st Diff^{ve} 2^d Diff^{ve}
 + 1st Prop^l part 1st Pro. part 2^d Prop^l part
 Sum
 - 2^d Prop^l part
 to this Numbers for an Index 2
 + Logarithm Co. Sec^t Distance centers
 Logarithm Numbers
 By Tab. 2^d with Dist. & less Alt. Distance less g° - more +
 Sum or Difference is the = Effect of Refracⁿ
 Distance of $\odot$ or $\star$ & $\odot$ centers
 Effect of Refraction +
 Distance clear'd of Refraction

For Parallax.

Altitude $\odot$ or $\star$ corr'd
 - Refraction p. 2
 Alt. $\odot$ or $\star$ corr'd Co. Sec^t
 Dist. $\odot$ or $\star$ & $\odot$ clear'd Refⁿ Sine
 Prop^l Log Hor^l Parallax
 Prop^l Log Arch 1st
 Altitude $\odot$ corr'd
 - Refraction p. 2
 Alt. $\odot$ corr'd Co. Sec^t
 Dist. $\odot$ or $\star$ & $\odot$ clear'd Refⁿ Tang^t
 Prop^l Log Hor^l Parallax
 Prop^l Log Arch 2^d
 Arch 1st bring down N^o
 Prin^{al} Effect of Parallax or Parallax in Distance
 Distance clear'd of Refraction
 Prin^{al} Effect of Parallax N^o 2
 Distance clear'd of Principal Effect of Parallax
 By Table 4th for second corrⁿ of Parallax N^o 3
 Reduced Dist. clear'd of Refraction & Parallax

Inc -
Contra -

A

DAILY ASSISTANT

F R O M T H E

Downs towards BENGAL.

Note, That in the year 1666, the Magnetic Axis and the true Axis, were in one direction; that is there was no variation; and ever since it has been West increafing, therefore all the courses and bearings are fet down without allowing for the variation in the Englifh Channel.

Directions for failing in and out of the Downs.

WHEN you come round the North Foreland, bring the light-house on it to bear N W b W. keep in that direction till you bring the upper light-house upon the South Foreland, in the

B

middle

Reference
to the
Appendix.

middle of the Southermost Swamp, which is the leading-mark for the Gull Stream. In that direction you may fail till you bring Sand-down Castle to bear W b S, then you are to the Southward of the break, and bring Upper Deal mill in one with Deal castle, which castle stands at the South end of the town; (as Sanddown Castle stands at the North end,) keeping in that direction, you may run into the Downs. Being in the Downs and having the misfortune to part your cables, and the wind Southerly, you must (as soon as you can) bring the upper light, which is on the South Foreland to bear S S W; keep that bearings till you bring the North-foreland light to bear N W b W, then you are to the Northward of the North-Sand Head; and may with safety go to Sea.

In failing out of the Downs towards the Southward, to know when you are clear of the South-Sand Head, is to bring Deal Mill and Walmer Castle in one, and the South Foreland, S. W. My design is only to give some necessary hints of the Channel, as there are charts in use which will be of more service I refer you to them. As to the Channel, it flows at Deal beach S E 9 hours, and in the Downs, S S E half tide half quarter 10hs. 30mts. From the South Foreland to Dungeness the course is S W half W distance 6 leagues. Dungeness is a low beachy point, on which
is.

is a lighthouse, with a light in the night time ; this point is very bold, and you may sail close by it in nine or ten fathom water ; there is good anchoring to the eastward of it from Westerly winds. From Dungenness to Beachy Head, the course is W S W near nine leagues. Beachy Head is a high steep white chalk cliff, and a little way to the westward of Beachy Head, there are Seven white chalk cliffs, so called from their number.

Reference
to the
Appendix.

From Beachy Head to the Isle of Wight the course is near W b S distance eighteen leagues, but in failing from Beachy Head to the Isle of Wight, you must take care of the East Barrow Heads, and Sea Owers, which lie seven leagues eastward of the Isle of Wight, and four leagues from shore ; the East Barrowhead lies from Arundel S b W four leagues, on which is but ten feet water, at low water, and is about three miles in length N and South, and two E and W. The Owers lie S S E from Chichester Church spire, and ten leagues from shore, and are about four or five leagues East, from Bambridge Point on the Isle of Wight ; they lie N E and S W and are about three leagues in breadth in the middle, narrow at both ends, and in some places dry at low water, there are many good marks to avoid them ; If you keep Dunnose West, you will be in a good birth without them ; keep in eighteen fathom.

Reference
to the
Appendix.

fathom water, and you will not be in danger. There is twelve fathom close by it ; the reason why so many ships have got upon these shoals, is the great indraught of the tide setting strong into St. Helens. In coming from the Eastward, come no nearer the Owers than eighteen fathom, and keep the Culver clift or Swan clift, W N W. It is a high steep white chalk clift, and is two miles West of Bambridge point, which is the Eastermost point of the Isle of Wight ; being come within a league and a half of the Swan clift, then bear in for St. Helens, and have a care of the spit that lies Eastward of Bambridge point ; when the Swan clift is shut in behind Bambridge point, then are you within it ; If you will anchor in St. Helens road, bringing the church to bear W S W then you may anchor in eight, seven, six or five fathom as you like.

From Dunnose to Portland, the course is W b S distant sixteen leagues. Portland road is an excellent one for Westerly and Southerly winds, and very good holding clear ground. As you sail for the road coming from the Eastward, you must have a care of the shoal called the Shambles, which hath but fourteen feet on it at low water ; the mark to avoid it is to bring Weymouth castle a fails breadth open of the Eastward part of Portland, it will carry you clear to the Eastward of the Shambles. You may anchor in

Portland

Portland road from five to ten fathom, bringing the Eastermost part of Portland to bear from South S b E and S S E; and coming from the Westward, you may fail close by the Bill into the road, and anchor as aforefaid. The Race of Portland is a great ripling of the tides caused by the unevenness of the ground at bottom, called overfalls, and where the sea is high and the tides strong, it breaketh in great seas, and one that is a stranger would think there was shoal water; this ripling or race beginneth a mile to the Eastward of the Bill, and about a mile or two off from it, and runs as far to the Eastward as St. Albans. From Portland to Torbay the course is West, distance about fourteen leagues. Torbay is a large place, and is very good and clear ground to anchor in, especially for Westerly Winds; you may anchor so far in as to bring the Berry head to bear S S E in ten, nine, eight or seven fathom as you are in the Bay. From Portland to the Start, the course is W b S half S, distance eighteen leagues. From the Start to Plymouth sound, the course is W N W half N distance seven leagues.

Reference
to the
Appendix.

Plymouth sound, lies a mile to the Eastward of Ramhead; from the Start to the Deadman, the course is W half N, distance sixteen leagues.

B*

From

Reference
to the
Appendix.

From the Start to the Eddystone, the course is West, Northerly distance seven or eight leagues.

From the Ramhead to the Eddystone, the course is S b W, distance four leagues.

From the Start to the Lizard, the course is W half S, distance twenty-three leagues.

From the Eddystone to the Lizard, the course is W b S, distance nineteen leagues.

The Start point I make to lie in latitude 50° , $0'$ N, and longitude 3° , $64'$ W from Greenwich.

The Lizard's latitude is 49° , $57'$, $30''$ N, and longitude 5° , $15'$ W from Greenwich.

N. B. Without the English channel, the bearings and distance will be set down according to the compass, as it will require time to get the variation properly settled. In the mean time I shall insert the variation, as it is at present taken by the gentlemen that compute the longitudes by taking the distance of the ☉ and ☽ or *, I therefore set down the latitude of the two principal Head

Lands

Lands, as they are the most likely places that ships take their departure from, when they leave England. It may be expected and with reason, that the first land to be seen is Porto Santo. In the year 1761, I being then on board His Majesty's Ship Deptford; Capt. Dudley Digges, we took our departure from the Lizard the 29th. of November, 1761, and the 9th. of December following we made Porto Santo, bearing S W b S distance ten or twelve leagues, which will be described by a drawing; we had then on board, Mr. Harrifon, with his father's watch for tryal to find the longitude, which did him honour in making the land. I make the Island of Porto Santo to lie in the latitude 33° , $16'$ N, and longitude from Greenwich, 16° , W. If you want to go into Funshall road, Madeira, you may with safety fail between the Desertors and Madeira.

Reference
to the
Appendix.

N. B. Take care you do not come nigh the Island of Madeira, if the wind is Northerly; as you will have flattering winds; do not haul in for the road, till you bring the Town of Funshall to bear North from you, then endeavour to get in, and it is most likely you will carry a sea wind into the road with you.

To

Reference
to the
Appendix.

To anchor in the road, bring the Leew Rock on which stands a Castle, which is a little to the Westward of the Town, to bear N b W in twenty or seventeen fathom water, then you will be about a mile and a half from the town. The extreams of the Island will bear between W b N, to E b S, and extreams of Desertors from S E half S to E S E. In the Bay it flows half past seven o'clock at full and change, and rises and falls about seven feet, but without any particular set of tide, or current. I observed for the latitude in the road and found it to be 32° , $29'$ N, and the longitude by the means of observation made lately, by taking the distance of the sun and moon to be 16° , $54'$ W from Greenwich, and the variation 15° , $00'$ W. I take the Southermost Desertor to lie in latitude 32° , $21'$ N. The Salvages are two patches of Rocks in latitude 30° , $17'$ N, longitude 16° , $7'$ W from Greenwich, and are surrounded with a bank of sand, you may fail by the East side; within a mile and a half, there is anchorage; the West side is all foul ground and must be avoided.

I take St. Croix road in the Island of Teneriffe, to be in latitude 28° , $28'$ N and longitude 16° , $5'$ W from Greenwich. At anchor in the road the extreams of the island will bear between the S W half S and S E, the Town S W b W, the Fort W, from shore
half

half a mile, the Grand Canary S E b S. The peak of Teneriffe I take to lie in latitude 28° , $13'$ N and longitude 17° , W; and the Island of Farro to lie in latitude 27° , $51'$ N, and longitude 17° , $57'$ W; variation 14° , $20'$ W; should it happen that there is a necessity to call at the cape De Verde Islands, I will give you such directions as have come within my knowledge. I take the cape De Verde to lie in the latitude 14° , $44'$ N and longitude 17° , $11'$ W.

Reference
to the
Appendix.

The Island of St. Jago, to be in latitude 15° , $00'$ N and longitude 22° , $45'$ W of Greenwich; the variation is 10° , $30'$ W. To anchor in Porta Pray road, bring the flag staff of the Fort to bear N N E, distance two miles and a half, then you will be in nine fathom water. The Isle of Sal, I take to lie in latitude 16° , $50'$ N, and longitude 22° , $49'$ W of Greenwich. Bonavista to lie in latitude 16° , $20'$ N and longitude 22° , $25'$ W of Greenwich. Brava to lie in latitude 14° , $28'$ N and longitude 24° , $07'$ W from Greenwich. By a good observation of the Sun and Moon the longitude by the observation was 24° , $33'$ W from Greenwich, then the East-end of Brava bore N 30° , $33'$ E, distance nine leagues, and when the middle of Brava bore N E half N distance eight or nine leagues, Feugo bore N E b E three quarters E, distance eighteen leagues. It must be remark'd that in crossing the S

Reference
to the
Appendix.

E trade, you may fall in with the Island of St. Paul's, whose latitude is supposed to be 1° , $20'$ S and longitude 25° , $30'$ W from Greenwich: and you may also fall in with the Island of Ferdinando Lorando. When the extrems of it bore between N 25° , E and N 40° E, the distance from the ship was six leagues; its latitude is 3° , $49'$ S and longitude 31° , $10'$ W and the variation 1° , $11'$ W. Note 1st. The Island of Trinidad lies by observation in latitude 20° , $28'$ S, and longitude 28° , $23'$ W from Greenwich. If I am informed right, there is a good harbour in it, and am told that a Dutch East-Indiaman put in there dismast'd, and other ways damag'd, they hove down and got masts to bring them home; there is a good stock of provisions to be had at reasonable rates. And you may also fall in with a bank which lies in the latitude 21° , $30'$ S and longitude 35° $00'$ W, on which bank there is thirty-four fathom and less, the sounding is red and white coral, this bank has been sounded upon three different times by the ships in the honourable East-India Company's service.

Should you be absolutely obliged to go for Rio De Janeiro as you stand to the Westward from the aforesaid sounding, you may fall in with an Island which lies in latitude 23° , $5'$ S and longitude 42° , $20'$ W which is a little way from Cape Frio. If you fall in

to

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Appendix.

to the Northward of it between it and cape Spirito Santo, you will have very irregular soundings. In sailing for Rio De Janeiro it is necessary to make this Island of Frio; the course from it is W by the compass, and it is best to sail pretty near the shore; without the harbours mouth, on the starboard quarter are two Islands of which the innermost is high and conic, the other at one end has a prominence which appears like a third Island, when these Islands bore S W b W about four or five miles distance they appeared as one, however as we advanced near the harbour they opened very distinctly; there is also an Island just without the Sugar loaf, which is a promontory on the main land, but it is not seen in coming from the Northward. Between the highest of the Islands, and the shore are three or four rocky Islands. In the latitude 23° , $03'$, S, cape Frio bore W half N, distance six leagues. When cape Frio bore E b N half N, distance five leagues, the Sugar loaf hill bore W half S about eight leagues, then distance from shore eight miles in forty-two fathom water ouze ground. When the entrance of the harbour of Rio Janeiro bore N W, distance three leagues, and the extrems of the land bore W S W half S to E b N half N then we were in twenty-eight fathom water. The promontory, or Sugar loaf is called mount de St. Juan, but

the

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Appendix.

the Conical peak is point De Suire ; this promontory stands on a peninsula at the West side of the river ; the peninsula itself forms a large bay, and within the bite without the Sugar loaf is a sandy bay and beach, which is fortified by a battery ; but by firing a gun you'll have a pilot come off long before you come in so far. I imagine the Sugar loaf to lie in latitude $22^{\circ}, 56' S$, and longitude $42^{\circ}, 45' W$ from Greenwich.

It is now certain that you may make the Island of Ascension as you will see by the tracks of ships from England on their outward bound passage to East India annex'd to this work, to which I refer. There will be three of them, one East, one West, and one in the middle. In order to come at the true variation of the compass in those tracks, in crossing the Atlantic Ocean, from the De Janeiro to the cape of Good Hope, you may fall in with the Island of Tristão Da Cunha which I take to lie in the latitude $36^{\circ}, 55' S$, and longitude $10^{\circ}, 39' W$. the N E end of the Island is steep up and down ; Variation $0, 30' W$. By astronomical observations taken at the cape of Good Hope upon the spot, the lands lie as follows, viz.

Cape Town lies in latitude $33^{\circ}, 55' S$, and longitude $18^{\circ}, 23' E$ from Greenwich.

Cape

A DAILY ASSISTANT FROM THE DOWNS TOWARDS BENGAL.

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Cape Point lies in latitude $34^{\circ} 29'$ S, and longitude $18^{\circ} 23'$,
E from Greenwich.

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to the
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Cape Falso or Hanglip, latitude $34^{\circ} 16'$ S, and longitude 18°
 $44'$ E from Greenwich.

Falso Bay lies in latitude $34^{\circ} 10'$ S, and longitude $18^{\circ} 33'$ E,
from Greenwich.

Saldanha Bay in latitude $33^{\circ} 10'$ S, and longitude $17^{\circ} 59'$ E
from Greenwich.

Dassen Island in latitude $33^{\circ} 25'$ S, and longitude $18^{\circ} 2'$ E
from Greenwich.

Hout Bay lies in latitude $34^{\circ} 03'$ S, and longitude $18^{\circ} 19'$ E,
from Greenwich.

When the land about Cape Falso bears between the N b E half
E, and N E b N, you will be upon the edge of foundings. When
you just see the land from the poop you will have one hundred and
thirty-six fathom water in latitude $35^{\circ} 30'$ South. This is a small
specimen of the bank, a further account of it I will give in more
particular instructions as we come from the Eastward.

E

When

Reference
to the
Appendix.

When you take your departure from the Cape, you must refer to the former latitudes and longitudes.

About 25° to the Eastward of the Cape in the latitude of $36^{\circ} 30'$ S. Capt. Slater saw a seal, and on conversing with some gentlemen at the Cape, found that a Dutch fleet much about that place had seen a large range of Breakers.

And if you intend to make Madagascar, and being near the latitude of it, it will be necessary to keep a good look out, and the lead going, as the land is low and there is founding out of sight of land. The South end of Madagascar lies in 27° , odd minutes; if bound through between Madagascar and the Coast of Africa, be careful not to stand too far to the Eastward, till you are in the latitude of $24^{\circ} 30'$ S: because the South end is full of rocks and foul ground, and you may likewise be set to the Eastward of the Island.

When shut in the channel endeavour to make the Island in the latitude 24° S. by standing in all day, and at night a long shore course, till you make the coast of Madagascar, and endeavour to be in sight of it every other day; it will guard you against strong currents,

rents that set Eastwards towards Masambique, where the land is very low and shallow water. By another remark I take the Bay of St. Augustine to lie in latitude 23° , $50'$ S, and longitude 53° $54'$ E from Greenwich.

Reference
to the
Appendix.

In going into that Bay there is a sandy Island on the starboard hand, one mile distance from it is twenty-five fathom, Coral rock: you may anchor in the Bay in ten fathom water, the Tent Rock bearing S, and Westminster Hall N E Northerly; then the extremes of the land will bear between N b E to W b S, distance from shore one mile. In the latitude 23° , $27'$ South, Westminster Hall bore South East, distance from shore nine leagues. In the latitude 21° , $52'$ S, the Northermost land in sight bore E b S, an Island S b E, distance from shore three or four leagues; the land in this latitude is very low and stretches much to the Eastward and makes like Islands. In the latitude 20° , $40'$ the land bore S E b S, distance five leagues, and imagined it to be Crab Islands; when Crab Islands bore S W half S, there was a small sandy Island bore N E b E half E, and a long range of breakers from E S E to the sandy Island; our distance from the Breakers was three miles, at the same time saw the main land over the Breakers almost from Crab Islands to the above-mentioned sandy Island; by keeping the
lead

Reference
to the
Appendix.

lead going at P M we had ground at seventeen fathom, coarse sand then wore ship and stood off under the topails. At three A M, we had no ground with a hundred fathom line; brought to under our topails. At half past five wore ship and made sail; at half past six ditto saw the land bearing S E: at noon 20° , $20'$ S P M came to anchor in six fathom; the land appeared like the land of Purfleet in Long-reach, which bore S W b S and Morandava river S E b S, and Northermost land in sight N E b E, off shore two or three miles. To conclude, the sandy Island is a most dangerous place, as it is steep to and very low; and I apprehend the Island before specified was seen by another ship who makes it lie in 18° , $22'$ S, and longitude 43° , $40'$ E from Greenwich.

N. B. In the latitude 23° , $10'$ S, and longitude 43° , $40'$ E, we saw a hill resembling the form of Westminster-hall (which is called by that name) and then we were about four or five leagues distance from land and in twenty fathom water.

The next land you expect to see is the Island of St. Christopher, which is a very low sandy Island; it lies N W, and S E and is in length two or three miles, and has a reef which runs out from each end about a mile, it is steep to otherways; there is one single

tree

tree in the middle of it, and by the S E end are several small bushes ; there is no founding within three or four miles of it. The S E end lies in the latitude 17° , $10'$ S, and longitude 43° , $12'$ E from Greenwich, variation 21° , $5'$ W.

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to the
Appendix.

When I took my departure from Madagascar, and allowing the land to lie in 24° , $30'$ S and longitude 44° , $5'$ E from Greenwich; I made a course N b E, distance two hundred and forty-eight leagues. I then saw the Island of Mohitta bearing between E S E and E N E.

As we saw the Breakers upon the shore, we judged ourselves three leagues off ; I make the S E end of Mohitta to lie in latitude 12° , $35'$ S, and longitude 44° , $02'$ E. and the S W end of Johanna to lie in latitude 12° , $28'$ S, and longitude 44° , $20'$ E from Greenwich. For by the mean of several observations in the road, it was found to be between 44° , $25'$ and 44° , $28'$ E from Greenwich. If you intend to anchor in Johanna road, you may sail by the Saddle Island within half a mile and then haul up S E and S E b S and keep within a mile of shore ; and when you see the Mosque, bring it to bear E three quarters S about three quarters, of a mile from shore ; then you will have eight fathom, and if you moor with the stream an-

F

chor

Reference
to the
Appendix.

chor to the offing, you will have twenty-five fathom where the anchor is let go: then you will have the following bearings, viz.

The Saddle Island will bear W b N which is the Western extrem; and the Eastermost extrem will bear N E b N, and the body of Comora W N W half N, and the North end of Mohitta W b N half N.

I take my departure from Comora N E end and allow it to lie in latitude 11° , $28'$ and longitude 43° , $50'$ E of Greenwich. The Island of Kelailies in latitude 8° , $16'$ N, longitude 72° , $40'$ E from Greenwich. This is a very low Island, and cannot be seen from deck above three or four leagues, the latitude and longitude is very justly set down, as it is the mean of several observations made in sight of the Islands.

Directions about the Island Ceylone. When the extreams of the land bore between N 10° W, to S $57'$ E, and the Hay cock N 51° E, and the flag staff of Point De Gall S E b E distance thirteen miles; and from the nearest shore five miles, then we were in thirty-five fathom water, and longitude by the $\odot$ and $\sphericalangle$ 80° , $12'$ E from Greenwich. And by another ship when the Dundra head bore

E N E

E N E distance six leagues, then in the latitude 5° , $50'$ N, and longitude 80° $10'$ E from Greenwich. When the flag staff of Point De Gall bore N 7° E distance about two miles and the Breakers upon the Whale bore N 52° W, in latitude 6° , $02'$ N, then in twenty-four fathom. In the latitude 6° , $05'$ N when the great Baffie bore N E b E half E distance four miles, then had fifteen fathom water. The following bearing was taken of a shoal, and the boat was sent from the ship to lie upon it viz. from the ship the Chimney (or Funnel) bore N N W one quarter W, the Elephant N W half W, the Lyon W half S, the little Baffie N E b N, and the boat at anchor in four fathom water N b W distance one mile and a half.

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Appendix.

Note, the compass did not stand so well as could be wish'd, but by taking the back bearings we found them as follows viz. the little Baffie bore from the boat N E b E distance four miles; the Funnel N N W half W five miles, and the Funnel and little Baffie bore off each other nearly W N W, and E S E; a hill like the Funnel N N W; another which we take to be Juliers Neuva, bore N W, when the little Baffie was in one with it.

In the latitude 6° , $34'$ N, when the extrems of the land bore between N and S W b W, the Lyon S W b W half W, and the
Elephant.

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Appendix.

Elephant W three quarters S, distance from shore four miles, sounding was between twenty to twenty-four fathom. In the latitude $6^{\circ}, 58' N$ when the extrems of the land bore between the N N W and S W b S distance from shore five or six miles; a hill making like the Fryers hood bore W S W. Note, the Fryers hood may be seen in the latitude $7^{\circ}, 30'$ and longitude $82^{\circ}, 16' E$ bearing W S W distance fifteen leagues.

When the extrems of the land bore between N W b W three quarters W to S half E, and the Islands of Providence S W b W distance from shore three leagues; we were in twenty-one fathom water.

Note, This Island appears like a building; it is a large white rock with small ones about it, the land hereabouts being very low and full of trees, of a dark green inclined to black; and the rock being almost white, makes it a remarkable spot not easily mistaken.

The man at the mast head when he first saw it called out a fail; we had then twenty-one fathom water, and in latitude $8^{\circ} 2' N$.

When the extrems of the land bore between N W and S half W, then the flag staff of Trincamalay bore W b N half N distance

five leagues; I take Trincamalay to lie in latitude 8° , $15'$ N; when you are in latitude 10° , $37'$ N and longitude 80° , $00'$ E from Greenwich, you may see the coast of Coromandel from the mast head, bearing between N N W and W S W. When you are in the latitude 12° , $52'$ N, and longitude 80° , $00'$ E from Greenwich, St. Thomas's mount will bear N W half W, distance from the shore five or six leagues.

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Appendix.

When you anchor in Madrafs road, you are to bring St. Thomas's mount to bear S W b W, and the flag staff of Madrafs Fort N W b W in seven fathom water, then you will be distant from the shore, one mile and a half.

N. B. From Madrafs to Bengal, see the the track for outward bound passage. It is requisite to give some account of the winds and weather at the different times of the year, viz.

To the Northward of the Equinox, between Ceylone to Acheew head down to Bengal.

N E Winds	-	-	-	{ January February
Variable	-	-	-	March
		G		Monsoon

Reference
to the
Appendix.

Monsoon breaks up with bad weather in April at Madras.

S W Winds and rain with bad weather
At Bengal, but fair weather on the
coast of
Coromandel

{ May
June
July
August

Variable

September

N E winds, rain and bad weather at Madras, {
but fair at Bengal - { October
November

N E winds, fair both at Bengal and Madras. December

Between the coast of Africa to the northward of the Equinox to the
Malabar coast.

Variable in March

Variable in September

SW winds {
and hard { April
rains { May
June
July
August

N E winds {
and fair { October
weather { November
December
January
February

Between the coast of Africa and Madagascar.

Variable in March

Variable in September

Southerly {
winds { April
May
June
July
August

Northerly {
winds { October
November
December
January
February

Between

Between Madagafcar and the Equinox.

Reference
to the
Appendix.

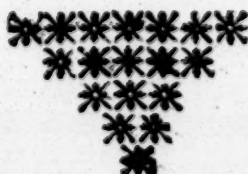
To the Northward of Madagafcar, the Southerly Monsoon shifts round by the S W ward : and the Northerly Monsoon by the N E ward.

Gulf of Mocho.

S. Easterly
winds {
December
January
February
March
April
May

N. Westerly
winds {
June
July
August
September
October
November

N. B. The first three months of each Monsoon it blows fresh ; the other three months it decreases to light airs. The current in the gulf of Mocho sets with the winds.



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A DAILY ASSISTANT FROM THE DOWNS TOWARDS MADRASS.

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Reference
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Appendix.

Weeks Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation
h 1	Took our departure from the Lizard, allowing it to lie in				
At noon	49 48 N	5 15 W	from Greenwich	0 / //	
☉ 2	49 0	6 05			
☽ 3	48 17	7 02			
♂ 4	47 44	7 26			
♀ 5	47 13	9 04			
♂ 6	44 18	11 03			
♀ 7	41 37	11 58	11° 44' 30" Corr.	13' 30" E	
♂ 8	39 02	12 19	12 37 Corr.	18 W	
♀ 9	36 36	12 38	13 31 Corr.	53	
☉ 10	34 18	13 27			
☽ 11	33 05	14 08			
♂ 12	31 21	15 55	15 24 30 Corr.	30 57 E	
♀ 13	30 17	16 07	The body of Salvages bore at noon S half W five miles.		
♂ 14	28 48	16 37	The island of Teneriffe bore at noon, from S half W, to W S W. Anchored there.		
☉ 18	26 19				
☽ 19	24 10	17 52	17 36 Corr.	0 16 E	
♂ 20	21 34	19 07	18 53 Corr.	14	
♀ 21	18 59	20 46	20 32 Corr.	14	
♂ 22	17 08	22 03	22 29 Corr.	26 W	
♀ 23	14 59	21 36	21 49 Corr.	13	
♂ 24	12 54	20 49	20 56 Corr.	7	
☉ 25	10 38	19 25			
☽ 26	8 23	18 01			9 15 W
♂ 27	7 00	16 55			11 21
♀ 28	5 49	15 55			11
♂ 29	4 49	15 08			11 10
♀ 30	4 02	14 43			
♂ 31	3 25	14 20			
☉ 32	2 46	14 20			
☽ 33	2 35	14 13			10 20
♂ 34	2 26	13 17	14 31 Corr.	1 14 W	11 49
♀ 35	2 28	13 10	13 53 Corr.	43	12
♂ 36	2 29	13 08	14 17 Corr.	1 9	
♀ 37	2 32	12 16	13 01 Corr.	45	
♂ 38	2 24	11 59	12 59 Corr.	1	12 59
☉ 39	2 24	11 46	13 34 Corr.	1 48	
☽ 40	2 00	10 56	11 36 Corr.	40	
♂ 41	1 52	10 58	11 38 Corr.	40	2 20
♀ 42	1 04	10 31	11 35 Corr.	1 4	12 20

Reference
to the
Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation.
♈ 43	0° 16' N	9° 52' W	10° 56'	Corr. W	1° 4'
♀ 44	0 7 S	9 12	11 14	Corr.	2 02
♊ 45	0 14	8 14	9 18	Corr.	1 04
☉ 46	0 23	7 57	9 01	Corr.	1 04
☽ 47	0 53	7 38	7 27	Corr.	11 E
♈ 48	1 19	7 26	7 34	Corr.	0 8 W
♀ 49	2 53	7 51	8 26	Corr.	0 35
♊ 50	5 02	8 56	10 29	Corr.	1 33
♀ 51	6 58	10 26	12 03	Corr.	1 37
♊ 52	8 02	11 56	13 49	Corr.	At 2 A M
being in the latitude of Ascension bore away W b N.					
☉ 53	At sunset saw the Island of Ascension, bearing W				
♊ 54	At 6 AM anchored there; longitude by observation,				
At 6 AM took a departure from Cross-Hill N					15 06 W
E b E distance 3 leagues					
at Noon	9 36	16 10 W			
♀ 55	12 04	17 20			
♊ 56	14 09	18 29	18 21	Corr.	0 8 E
☉ 57	16 11	18 58	18 43	Corr.	0 15
☽ 58	17 22	18 40	18 14	Corr.	0 26
♈ 59	17 33	18 40	18 57	Corr.	0 17 W
♀ 60	18 13	19 01	9 00	Corr.	0 1 E
♊ 61	20 03	19 39	20 06	Corr.	0 23
♀ 62	22 33	20 29	20 44	Corr.	0 15 W
♊ 63	24 21	20 29	20 44	Corr.	0 15
☉ 64	25 46	19 24	19 39	Corr.	0 15
☽ 65	27 30	16 30			3 44
♈ 66	28 40	14 22	15 04	Corr.	0 42
♀ 67	28 41	14 09	14 51	Corr.	0 42
♊ 68	29 04	14 05	14 42	Corr.	0 37
♀ 69	30 14	12 13	12 50		
♊ 70	31 17	10 15	10 52		
☉ 71	31 43	7 37	8 14		
☽ 72	31 31	6 16	6 53		
♈ 73	32 07	5 12	6 36	Corr.	1 24
♀ 74	33 01	3 30	5 22	Corr.	1 52
♊ 75	33 58	1 41	3 59	Corr.	2 18
♀ 76	34 53	0 14 E	1 58		1 44
♊ 77	34 47	1 18	0 54	Corr.	0 24 E
☉ 78	35 18	1 42	0 23	Corr.	1 19
☽ 79	36 39	2 05	1 15		50
♈ 80	37 30	3 19	1 20		13 54
♀ 81	38 08	4 54	2 55		

A DAILY ASSISTANT FROM THE DOWNS TOWARDS MADRASS.

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Reference
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Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon	Longitude by O, D or *. at noon.	Difference.	Variation.
82	38° 17' S	7° 53' E	5° 54' E		16° 51'
83	37 57	10	8 01		
84	37 39	13 34	11 35		19 31
85	37 42	17 24	15 25		
86	37 34	20 15	19 52		Sounded no Ground
87	37 49	23 13	22 50		
88	37 36	26 40	26 17		
89	36 23	29 57	29 34		
90	35 26	31 42	29 12	C rr.	2° 30' E
91	34 46	32 35	30 05		26 5
92	33 30	34 43	32 04	Corr.	2 39
93	32 38	35 30	2 51		
94	30 30	37 04	4 25		
95	29 27	37 57	37 04	Corr.	0 53
96	29 02	37 59	37 06	Corr.	0 53
97	28 37	37 35	36 42		
98	27 12	38 59	38 06		
99	25 21	39 22	39 18	Corr.	0 04
100	24 9	39 19	39 15		25 0
101	22 43	38 47	38 28	Corr.	0 19
102	20 05	39 10	37 41	Corr.	1 29
103	18 59	40 30	39 01	Corr.	1 29
104	18 24	41 07	39 38	Corr.	1 29
105	17 53	41 26	38 43	Corr.	2 43
106	17 37	41 54	37 56	Corr.	3 58
107	17 40	42 04	38 46	Corr.	3 18
108	16 42	43 11	39 21	Corr.	3 50
109	15 25	45 23	41 09	Corr.	4 14
110	14 04	46 45	42 31		
111	13 09	47 46	43 32		
112	12 20	47 57	At 3 p. m. saw the Island of Mohitta bearing NN E. distance 12 leagues, and next day anchored at Johanna.		

A DAILY ASSISTANT FROM THE DOWNS TOWARDS MADRASS.

Reference
to the
Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or ♀. at noon.	Difference.	Variation.
h 1	11° 29' S	44° 32' E	Took a departure from Joanna, it bore at Noon S B W half W. 14 leagues.		
☉ 2	9 55	45 25	45° 24' Corr.	0° 01' E	17° 21' W
☽ 3	8 37	46 30	45 53 Corr.	0 37	16 10
♀ 4	6 06	48 2	47 40 Corr.	0 22	15 30
♂ 5	4 40	49 8	47 57 Corr.	1 11	14
♂ 6	2 48	50 56	49 45		14
♀ 7	1 03	53 15	50 50 Corr.	2 25	11
h 8	0 8	55 41	54 43		10 30
☉ 9	1 30 N	57 22	56 24		
☽ 10	2 43	59 23	59 47 Corr.	0 24 W	8 03
♀ 11	4 12	61 39	60 53 Corr.	0 46	4 46
♂ 12	5 40	63 54	64 23 Corr.		4 03
♂ 13	7 02	65 57	66 26		3 23
♀ 14	7 52	68 16	68 45		
h 15	7 45	70 38	71 07		
☉ 16	7 41	72 51	73 09		
☽ 17	7 24	74 37	75 10 Corr.	0 33	10 W
♀ 18	6 50	76 22	76 53 Corr.	0 31	0 10 E
♂ 19	6 6	78 11	78 36	0 25	
♂ 20	5 53	79 24	79 57		
The extrems of the Island Ceylone bore between N b E & W distance from shore 4 or 5 leagues, but so hazey cannot tell part of the Island. We were then in 35 fathom, fandy bottom.					
♀ 21	7 24	80 41	81 16		0 30
h 22	7 57	80 31	81 06		1 14
☉ 23	8 46	79 54	80 29		0 30
☽ 24	10 18	78 49	79 24		
♂ 25	12 6	78 4	78 39		
At Noon the land bore from W b S to N b W 2 or 3 leagues.					
♀ 26	At 6 p. m. Sadra's Flagstaff bore W b N distance 5 or 6 miles, at A M came to anchor.				

A DAILY ASSISTANT FROM THE DOWNS TOWARDS BOMBAY.

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The SECOND TRACT.

Reference
to the
Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation
Took our departure from the start, allowing it to lay in					
	50° 9' N	3° 46' W	from Greenwich.		
♂ 1	49 17	5 31			
♀ 2	47 44	8 36			21° 01' W
♂ 3	45 55	11 52			
♀ 4	44 24	12 44			
♂ 5	42 24	13 40			
☉ 6	41 51	12 42			
☽ 7	41 53	12 13			
♂ 8	41 32	12 35	13° 55' Corr.	1° 20' W	
♀ 9	40 54	11 02	12 45		
♂ 10	40 54	11 50	13 33		
♀ 11	39 54	12 14	13 57		
♂ 12	37 42	12 55	14 19		19 03
☉ 13	36 30	13 16	14 40		18 41
☽ 14	35 10	13 48	15 12		
♂ 15	34 02	14 42			
♀ 16	33 06	14 42	Madeira W half N distance twelve leagues, allowing it to lay in		
	32 36	17 26	W from London		17
♂ 17	in sight of Madeira.				
♀ 18	29 33	18 50	18 03	At 7 P M Palmo bore	
	S b E half E.				
♂ 19	27 24	18 50	18 56		
☉ 20	24 54	19 20	19 26		
☽ 21	22 28	19 42	19 48		13 19
♂ 22	18	20 03	20 31		12 48
♀ 23	18 39	20 29	20 57		12
♂ 24	16 34	20 52	20 47		1 20
♀ 25	14 55	21 11	21 07		0 05
♂ 26	13 48	21 25	21 27		0 40
☉ 27	12 25	21 40	21 50		9 30
☽ 28	9 57	21 40	21 50		8 50
♂ 29	8 28	21 45	22 05		

A DAILY ASSISTANT FROM THE DOWNS TOWARDS BOMBAY.

Reference
to the
Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation.
♀ 30	6° 57' N	21° 50	22° 10' W		
♂ 31	6 03	21 41	22 02		
♀ 32	5 03	21 33	21 53		
♂ 33	4 50	21 55	22 15		
☉ 34	3 12	23 14	23 34		7° 05' W
☽ 35	2 54	24 26	24 46		6 30
♂ 36	2 34	24 40	25		
♀ 37	1 59	25 07	25 20		
♂ 38	0 54	26 20	27		4 30
♀ 39	0 17	27 10	28 14		4 19
♂ 40	0 41 S	27 51	29		
☉ 41	2 05	28 28	29 28		3
☽ 42	3 45	29 03	30 03		
♂ 43	5 15	29 45	30 45		
♀ 44	6 53	30 16	30 14		
♂ 45	8 20	31 03	31 01		
♀ 46	9 42	left off	31 25		
♂ 47	11 07		31 38		
☉ 48	12 16		32 25		
☽ 49	13 12		33 23		1 48 E
♂ 50	13 58		34 09		2 04
♀ 51	14 39		36 27		3
♂ 52	15 01		36 56		3
♀ 53	15 32		36		
♂ 54	16 07		35 44		3 22
☉ 55			36 06		3 20
☽ 56	16 38		37 07		3
♂ 57	17 38		37 20		2 33
♀ 58	19 21		36 19		3
♂ 59	20 34		35 33		3
♀ 60	21 31		34 52		
At 2 P M founded Ground twenty-four fathom red and white coral.					
♂ 61	21 42		34 42		
☉ 62	22 03		34 30		2 02

A DAILY ASSISTANT FROM THE DOWNS TOWARDS BOMBAY.

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Reference
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Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or *. at noon.	Difference.	Variation.
☽ 63	23° 16' S		33 49 W		2° 15' E
☿ 64	25 17		32 30		2
♀ 65	27 10		31 06		1 30
♂ 66	27 31		30 40		
♀ 67	28 07		30 13		
♂ 68	28 45		29 06		50
☉ 69	29 38		28 40		
☽ 70	29 55		28 28		
☿ 71	31 09		28 04		
♀ 72	32 25		27 03		
♂ 73	33 36		24 39		1 2
♀ 74	34 42		20 44		0 50 W
♂ 75	35 11		18 06		1 12
☉ 76	35 22		14 13		4
☽ 77	35 23		11 26		
☿ 78	34 55		10 53		6
♀ 79	34 04		9 04		
♂ 80	33 30		7 15		
♀ 81	33		5 22		
♂ 82	32 51		3 40		
☉ 83	33		2 47		12 10
☽ 84	33 48		0 02		
☿ 85	35		4 11 E		15 13
♀ 86	35 34		8 51		15 30
♂ 87	36 02		12 11		16 30
♀ 88	35 45		15 06		
♂ 89	35 30		16 33		20 25
☉ 90	35 34		16 47		
☽ 91	35 30		18		
☿ 92	At Sun set, saw Cape Falso, bearing N E. about eighteen leagues ditto took my departure from it, allowing it to lay as before specified.				

A DAILY ASSISTANT FROM THE DOWNS TOWARDS BOMBAY.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or ♀. at noon.	Difference.	Variation.
♀ 93	36° 45' S				22° 40' W
♂ 94	36 43				
♀ 95	36 36				26
♂ 96	35 55		33° 09' E Corr.		26 30
☉ 97	34 07		35 06		25 15
☽ 98	33 56		35 30 Corr.		
♀ 99	31 36		36 42		
♂ 100	29 37		36 42 Corr.		
♂ 101	28 35		39 21 Corr.		
♀ 102	27 35		40 45 Corr.		24 45
♂ 103	25 48				
☉ 104	25 09		42 15 Corr.		23
☽ 105	25 14		42 20 Corr.		
♂ 106	24 39		44 05 Corr.		23 50
At 9 A M saw Madagascar bearing from E S E to N E. at noon the nearest shore distance five leagues.					
♀ 107	At 5 P M. the extrems of the land bore from N b E to S E from the nearest shore two leagues, allowing it to lay				
	24 30 S	44 05 E	of Greenwich.		
♂ 108	24 01		43 17 E		24
♀ 109	22 24		43		23 40
♂ 110	21 39		42 44		23
☉ 111	21 41		42 38		
☽ 112	21 40		42 15 Corr.		
♂ 113	19 59		42 35 Corr.		
♀ 114	18 14		42 57 Corr.		
♂ 115	16 22		43 10 Corr.		21 00
♀ 116	14 07		44 26 Corr.		19 30
♂ 117	14 24		44 24		18 25
In sight of Johanna. Madagascar bore by account S b W. distance 248 leagues.					
☉ 11	Anchored in Johanna road				

A DAILY ASSISTANT FROM THE DOWNS TOWARDS BOMBAY.

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Reference
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Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation
Took our departure from Johanna, allowing it to lay in Lat. 12° 12' S. Long. 43° 46' East from Greenwich.					
☿ 1	10° 54' S				
♀ 2	9 28				
♂ 3	6 27				
☉ 4	5 00	44° 42'	43° 10' Corr.	1° 32' E	16° 00' W
☽ 5	3 08	45 50	44 16		
♂ 6	1 41	47 20	45 38 Corr.	1 42	
♀ 7	0 41	48 52	46 13 Corr.	1 39	
☿ 8	0 23 N	50 21	47 35 Corr.	2 46	12 30
♀ 9	1 17		48 56		9 36
♂ 10	2 47		50 07		10 40
☉ 11	4 19		51 03 Corr.		9 40
☽ 12	5 20	56 06	53 08 Corr.	2 58	8 20
♂ 13	6 32	57 25	55 20 Corr.	2 05	7 30
♀ 14	7 59	58 36	56 26 Corr.	2 10	
☿ 15	9 21	59 37	58 33 Corr.	1 4	6 07
♀ 16	10 42		59 59		4 50
♂ 17	11 36		61 22		
☉ 18	12 40	64 02	62 36 Corr.	1 26	3 25
☽ 19	14 01	65 57	64 28		2 55
♂ 20	15 20		66 37		
♀ 21	16 26		68 36		
☿ 22	17 53		70 07		1 12
♀ 23	18 57	In soundings between 43 fathom and 35 ditto			
♂ 24	In the night saw blue Lights every two hours; they proved to be from Old Woman's Island,				
☉ 25	At 5 P.M. anchored in Bombay Harbour.				

A DAILY ASSISTANT FROM THE DOWNS TOWARDS BOMBAY.

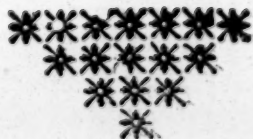
As we have given Remarks in the first part as far as Johanna, I will give in this place the Remarks from Johanna to Bombay.

When Comera bore between the $S\ 35^{\circ}\ W.$ and $S\ 50^{\circ}\ W.$ distance seventeen leagues. I took a departure, allowing the N E end to lay in latitude $11^{\circ}\ 40'\ S.$ and longitude $43^{\circ}\ 50'\ E.$ from Greenwich. Being in the latitude $0^{\circ}\ 30'\ S.$ near which is the shoal of the Yas de Cunbar we kept a good look out.

“ Note, This shoal was made by one of his Majesty’s frigates
 “ in a short and fine run from Comero. The current which set
 “ to the S W. was frequently tried and allowed for. They
 “ made $6^{\circ}\ 15'\ E.$ longitude from Comero. A note upon it
 “ says, that it may extend to the line and even farther.” We
 had smoother water than usual, and the next morning the SE swell
 was up again, so that one would be inclined to believe that the
 Yas de Cunbar was not far to windward of us. When we passed the
 latitude of Yas de Cunbar, for three days after, had several boobies
 about the ship, most of them of the gray kind commonly called
 Gannets. In the latitude $13^{\circ}\ 30'\ N.$ and longitude $72^{\circ}\ 40'\ E.$ from
 Greenwich, had sounding upon the bank of Padona. Note, This
 bank furrounds the Island of Bancapini the northermost of the
 Lacca-

Laccadives, we had from 20 to 50 fathom, the first white sand and gravel, the latter coral rock; and after that no ground. When the land bore between SE b S and N b E. and Hunary and Kanary bore N 36° E. and the Island at the entrance of Rajapore bore S 86° W. distance five leagues, we were in latitude $18^{\circ} 32' N$. next day anchored in Bombay, the Fort bearing North distance one mile.

Reference
to the
Appendix.



A DAILY ASSISTANT FROM THE DOWNS TOWARDS CHINA.

Reference
to the
Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or ♀. at noon.	Difference	Variation.
♂ 1	Took a departure from the Start, allowing it to lay in 50° 9' N 3° 46' W from Greenwich.				
♀ 2	49 12		6° 29' W		
♂ 3	46 01	9 16			
♀ 4	45 14	10 06			
♂ 5	43 33	11			20° 24' W
♀ 6	41 19	12 05			
♂ 7	39 03	13 47			
♀ 8	37 33	14 21			
♂ 9	36 53	14 52			
♀ 10	34 32	15 40			
♂ 11	32 40	16 16			13 46
♀ 12	30 42	17 03			
♂ 13	29 03	17 23			11 42
♀ 14	27 42	17 28	19 19' Corr.	1° 51' W	13 37
♂ 15	25 49	17 03	19 25 Corr.	2 22	
♀ 16	23 56	16 45	19 11 Corr.	2 26	
♂ 17	22	16 56	19 34 Corr.	2 33	
♀ 18	20 50	16 23	19 04		
♂ 19	19 15	16 44	19 25		
♀ 20	18 02	17 52	20 23		
♂ 21	17	18 37	21 18		9 30
♀ 22	15 26	21 27			
♂ 23	13 07	20 25			
♀ 24	11 39	19 53	20 30 Corr.	37	
♂ 25	10 46	19 36			
♀ 26	9 55	19 26	20 01 Corr.	0 35	
♂ 27	8 52	19 18	20 50 Corr.	1 32	
♀ 28	7 30	19 06	21 02		
♂ 29	6 24	18 56	21 30 Corr.	2 34	
♀ 30	5	18 38	21 Corr.	2 22	
♂ 31	3 47	18 11	22 32 Corr.	4 21	
♀ 32	2 47	17 42	22 03		
♂ 33	2 33	17 36	23 26 Corr.	5 50	

A DAILY ASSISTANT FROM THE DOWNS TOWARDS CHINA.

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Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or ♀. at noon.	Difference.	Variation.
☉ 34	2° 31' N	17° 21' W	23° 11' W		
☽ 35	2 40	17 16	23 06		
♂ 36	2 40	16 01	22 51		
♀ 37	2 16	16 41	22 31		
♂ 38	1 29	16 41	22 31		
♀ 39	1	16 29	22 19		
♂ 40	0 31	16 40	22 30		
☉ 41	0 38 S	17 26	14 40	Corr.	2° 46' E
☽ 42	2 13	18 32	15 46		10° 45 W
♂ 43	3 43	19 47	18 08	Corr.	1 39
♀ 44	5 04	20 52	19 21	Corr.	1 31
♂ 45	6 32	22 26	21 30		56
♀ 46	7 57	23 44	23 05	Corr.	0 39
♂ 47	9 34	24 58	24 31	Corr.	0 27
☉ 48	11 20	25 29	25 02		
☽ 49	13 02	25 27	25 30		
♂ 50	14 29	26 26	25 29		
♀ 51	16 04	27 14	26 47		
♂ 52	17 10	27 43	27 16		
♀ 53	18 48	27 43	27 16		
♂ 54	20 33	27 19	27 42	Corr.	0 23 W
☉ 55	22 40	26 35	26 53	Corr.	0 18
☽ 56	23 59	25 37	26 15	Corr.	0 38
♂ 57	25 06	24 34	25 17		
♀ 58	25 36	24 16	24 54		
♂ 59	26 43	23 44	24 22		
♀ 60	27 39	22 52	24	Corr.	1 08
♂ 61	29 32	21 28	22 36		
☉ 62	30 27	19 18	20 26		
☽ 63	31 48	16 47	17 55		
♂ 64	32 34	14 52	16		
♀ 65	33 11	12 42	13 50	Corr.	1 08
♂ 66	33 40	10 33	11 41	Corr.	1 08
♀ 67	34 06	8 17	9 25		
☉ 68	34 32	6 05	7 12		

Reference
to the
Appendix.

Reference
to the
Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or ♀. at Noon.	Difference	Variation.
☉ 69	34° 55' S	3° 40' W	4° 47' W		
☽ 70	35 07	0 30	0 14 E Corr.	44 E	
♂ 71	35 10	2 59 E	5 24 Corr.	2 25	
♀ 72	35 08	5 32	6 54 Corr.	1 22	
♂ 73	34 43	8 53	10 12 Corr.	1 19	
♀ 74	33 12	11 27	13 Corr.	1 33	
♂ 75	34 13	14 09	15 54 Corr.	1 45	
☉ 76	34 25	15 02	16 54 Corr.	1 52	
☽ 77	34 35	15 27	17 19 Corr.	At noon the extrems of the land in sight, and bore between E b N. and E b S. half S. distance from the nearest shore twelve leagues, the Table land bore E half S.	
♀ 1	I took my departure from Cape Falso, allowing it to lay as be- fore specified; and intending to go by the Southern Passage.				
♂ 2	35 37	20 04 E			21 49 W
♀ 3	36 14	21 35			22 10
♂ 4	37 24	22			
☉ 5	37 58	23 10			22 30
☽ 6	37 58	23 36			
♂ 7	38 28	28 42			
♀ 8	38 34	31 56			
♂ 9	38 58	33 45			
♀ 10	39 32	34 45			
♂ 11	39 26	37 14			
☉ 12	39 16	39 35			
☽ 13	39 26	41 39			27 15
♂ 14	39 50	43 01			28
♀ 15	40 14	45 43			
♂ 16	40 48	48 44			
♀ 17	40 24	49 10			
♂ 18	39 59	51 14			
☉ 19	39 55	54 44			
☽ 20	39 06	56 31			26 25

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Reference
to the
Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation.
♂ 21	38° 50' S	57° 37' E			
♀ 22	38 53	60 39			25° 10' W
♂ 23	38 12	64 28			24
♀ 24	37 48	67 15			
♂ 25	37 52	68 17			
♀ 26	37 38	70 49			21 25
♂ 27	37 45	73 17			
♀ 28	37 55	75 41			19 20
♂ 29	37 44	79 12	At 3 P M saw the Island of St. Paul.		
♀ 30	37 34	82 22			17 50
♂ 31	37 48	84 11			
♀ 32	38 11	86 10			
♂ 33	37 26	87 46			14 50
♀ 34	36 48	89 13			
♂ 35	36 20	91 24			14 10
♀ 36	36 50	93 36			
♂ 37	37 24	93 42			
♀ 38	36 53	94 31			12 40
♂ 39	36 46	94 41			
♀ 40	36 06	95 05			
♂ 41	34 21	96 41			9 59
♀ 42	32 41	98			
♂ 43	31 49	98 41			
♀ 44	29 36	100 17			8 35
♂ 45	27 12	101 11			
♀ 46	24 59	101 49			
♂ 47	23 24	102 20			5 20
♀ 48	21 25	102 59			5
♂ 49	19 29	103 28			4 30
♀ 50	17 25	103 53			
♂ 51	15 42	104 03			3
♀ 52	14 11	104 11			
♂ 53	11 52	104 26			
♀ 54	9 51	104 26			
♂ 55	8 08	104 37			2 30 E
♀ 56	7 27	102 36	At half past 5 P M. saw the Island of Java,		
			the Extrems bore from N 82° 15' E to North 37° 10' W. distance		
			from the nearest shore five leagues, and at noon the extrems		
			of the land bore between the N W b N. and E half N.		
♀ 57	Anchored at the Watering Place.				

Reference
to the
Appendix.

REMARKS from the Cape of Good-hope
towards Java-head and China, by the
Southern Passage.

When you take your departure from the Cape of Good-hope you may refer yourself to the latitudes and longitudes before specified.

About 25° , to the eastward of the Cape in the latitude of $36^{\circ} 30'$ S. Capt. Slater saw a seal, and on conversing with some gentlemen of the Cape, found that a dutch fleet much about that place, had seen a large range of Breakers.

The first land you may expect to see in your passage, is the Island of St. Paul, which I judge to lie in latitude $37^{\circ} 58' S$, and longitude $76^{\circ} 30' E$, when this Island bears E N E, it will appear with four rising hills, the Northermost the highest, and is more peaked than the others, the Southermost of these hills slopes away to a low point running out from it.

When

When you arrive in the latitude 22° , $30'S$, and longitude 103° $00'E$, it will be necessary to keep a good look out for Clats Island; as will appear from extracts of two different journals in 1771 viz.

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to the
Appendix.

At 10 P M being very near the British King, observed her to heave to to the Eastward, and lower her topfails; as we were going through the water very fast, soon shot by her, and as we passed by her, Capt. Hore call'd to us and observed the water was much discoloured, we brought to with our head to the Southward and founded: got ground forty fathom, stiff clay, on which we fill'd and stood off S W, next cast no ground. We then made false fires, and shewed lights but believe they did not follow us, and by its situation by our account, thought it to be a bank till now undiscovered: we brought to in order to assist the other ship, but in the morning saw nothing of her. At noon the day before we were in latitude 21° , $54'S$ and longitude by account 100° , $29'E$ from London.

And from that noon to the time we struck founding we run N b E half E, distance 59 miles, the variation was then 5° W.

British King's remark at the same time. Being in company with the Harcourt at ten P M the sea appearing of a whitish colour as

M

if

Reference
to the
Appendix.

if we were in shoal water ; we immediately brought to, and hail'd Capt. Paul of course : [which induced him to wear to the S W] we founded and found no ground with one hundred and thirty-five fathom : look'd upon the change to be nothing more than the reflection of the clouds on the water [as we had seen the same between Johanna and Cape Comarin] therefore wore and kept on under our topfails, founding, and a signal out for the Harcourt, but not seeing her the next morning concluded she lay too all night. *N. B.* This will confirm the foregoing remark.

And also in the latitude 19° , $00'$ S, and about the same longitude keep a good look out for the Tryal rocks ; and in the latitude 10° , $00'$ S. and something more to the Eastward for Christmas Island.

Should you happen to fall in to the Eastward of Java-head 6° , $00'$ E, you will see a burning mountain which has a very high peak, and is far in land. When we saw it, the extrems of the land bore between E N E, and W b N. This burning mountain is, I suppose, the same that is seen sometimes in clear weather in Batavia Road, bearing S E. But when you see land in the latitude 8° , $8'$ S, then you may be sure that you are two or three degrees to the Eastward of Java head.

When

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to the
Appendix.

When Trowers Island bore N E b E 8 miles, the body of Capis Island bore N W b N four miles, and the high land to the Eastward of Java head bore N b W three quarters W. You may sail by the Fryer within a quarter of a mile. Java head lies in latitude 6° , $48'S$, and longitude 103° , $50'E$, from Greenwich. There is a watering place between the first and second point, and when you are at anchor in nine fathom, you will have the following bearings, viz. The second point of Java bore N E, the peak of the Island of Princes N 5° , W, the Southermost of the Carpenters W N W half N, the N point of Mew Island W b N half N; the watering place S b E half E, the wooding place S W half S, distance one mile. There is a ledge of funken rocks, from the S half E, to S E b E on which there is from seven fathom to two or three feet, so that a boat cannot go over it at low water, spring tides, and is distant from the ship about half a mile, and from shore one mile and a half; there is a five fathom channel between it and the shore.

Remarks

Reference
to the
Appendix

REMARKS for sailing through the Straights
of Sunda and Banca towards China.

- 1 When the third point of Java bore N W half W, Celibes bore N N W thwartway N E b N and the 4th point of Java N E b E distance five leagues, we had sounding between 29 and 25 fathom, in the latitude of $6^{\circ} 27' S$.
- 2 When the third point of Java bore S b W half W distance two or three miles, we had twenty-two fathom water in latitude $6^{\circ} 07' S$.
- 3 Little winds and calm; at sun set thwartway bore between N b W half W to the N W. Anger point S b W, the Dutch-house S b E distance three miles; the fourth point of Java bore S b W three quarters W. St. Nicholas's point N E, Button N b E half E; at noon thwartway bore between W N W half N to W three quarters S; St. Nicholas's point N E b E, and the Button N. In the latitude $5^{\circ} 55' S$.

Light

Days.

4 Light breezes and little winds all night, at two P. M. the North island bore N W, and Button S W half W; at four ditto, North Island W three quarters N. Hog Point S W b W, thwartway S W half S. Button SSW one quarter W. Bantam Point S three quarters E. At sun set, North Island S 60° W. St. Nicholas's or Bantam Point S 9° E. At sun rise, the Sisters N three quarters E and N one quarter E ten or eleven miles; at half past eleven past the Sisters at about six miles distance, in thirteen fathom water. At noon they bore S $12^{\circ} 15'$ E, and S $38^{\circ} 45'$ E, distant about one or two miles, then the extrems of Sumatra bore from N W to S W b W, distant four leagues. I make the latitude of the Sisters about $5^{\circ} 02'$ S. Soundings this twenty four hours were from thirty fathom to thirteen; at noon latitude $5^{\circ} 11'$ S.

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to the
Appendix.

5 This twenty-four hours little winds keep the lead going, chiefly a clay bottom, between ten fathom and thirteen ditto. Variation about $0^{\circ} 45'$ W. At four P. M. the two Sisters S b W half W, distance twelve miles, at sun set, they bore S b W. three quarters W distant seven leagues, latitude at noon $4^{\circ} 16'$ S.

N

This

A DAILY ASSISTANT FROM THE DOWNS TOWARDS CHINA.

Days.

6 This twenty-four hours fine weather at two P. M. the current sett N N W one knot. At six ditto it set N b W half W seven fathom. By the medium of seven azimuths and two amplitudes, by two compasses, the variation is $00^{\circ} 52' W$. At seven A. M. the Banco shore bore from N N E to N N W. distance six or seven leagues. At ten ditto, Lucipara bore $N 38^{\circ} 40' W$, distance twelve miles. At noon it bore $N 20 10' W$. distance seven miles; the extrems of Banco, bore from $N 11^{\circ} E$ to $N 39^{\circ} E$. Latitude $3^{\circ} 27' S$. This twenty-four hours soundings from ten to six fathom.

7 This twenty-four hours a pleasant breeze; at four P. M. the first Point of Sumatra N half W. Southermost extream S W three quarters S. the body of Lucipara E S E. At six ditto, the first Point of Sumatra W b N, Lucipara S. half W. Point Lattary E N E. and the Parmifang-hill N b W three quarters W. At sun rise Parmifang hill N N E half E. Lattary Point E S E half S. Second Point of Sumatra N W. At noon the third Point of Sumatra N W one quarter W, the second Point of ditto S b E three quarters E. Mount Parmafang S E b E, and the extrems of Nanka Island E b N three quarters N to the N E b N distance from Sumatra five or six miles.

N. B. In

N. B. In crossing from Lucipara to the first Point of Sumatra, had two or three casts of the lead and by a mistake of the helm got into three and a half fathom, otherwise should have carried four fathom with the greatest safety and certainty by keeping Sumatra shore on board.

8 I take Monopin hill to lay in latitude $2^{\circ} 00' S.$ and longitude $104^{\circ} 10' E$ from Greenwich.

9 When the Monopin hill bore North, and the fourth Point of Sumatra $S E b S$, then the extrems of ditto bore between $E b S$ half S and $W b S$ half S . distance five miles.

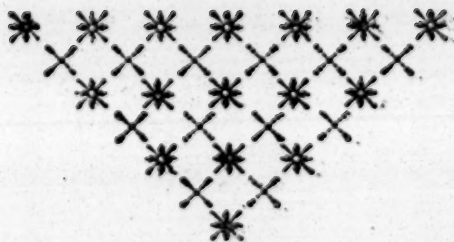
And when Pulo Taya bore $N 66^{\circ} W.$ then the northermost of the Seven Islands bore $S 29^{\circ} 30' E.$ The account by reckoning is kept from the Monopin hill. The latitude of Pulo Taya is $0^{\circ} 50' S.$ At noon we were in $0^{\circ} 56' S.$ then had fourteen fathom.

When the extrems of Pulo Lingin (or a small island near it) bore between $N 52^{\circ} W.$ and $N 59 W.$ Pulo Taya bore SW half $W.$ distance twelve leagues.

A DAILY ASSISTANT FROM THE DOWNS TOWARDS CHINA.

At noon we were in latitude $0^{\circ} 29' N.$ and by account the Monopin hill bore $S 15^{\circ} W.$ distant 154 miles.

At 7 A M saw Pulo Auroe bearing $N W$ distance five or six leagues. At noon bore $S W$ half $W.$ distance eight or nine leagues. I reckon it lays in latitude $2^{\circ} 31' N.$ and longitude $103^{\circ} 50' E$ from Greenwich, which I believe is pretty near the truth as may be proved by the ship's run, and observations in their passages from Madrafs, through the Straights of Malacca and Sanfipora.



REMARKS from Madrafs towards China.

Days.

- 1 I took a departure from Madrafs Church, latitude $13^{\circ} 13' N$. and longitude $80^{\circ} 12' E$ from Greenwich. At noon were in latitude $13^{\circ} 00' N$. and longitude $80^{\circ} 20' E$ of Greenwich.
- 2 At noon, latitude $12^{\circ} 24' N$ and long. $82^{\circ} 06' E$ from Greenwich.
- 3 At noon, ditto $11^{\circ} 32'$ and ditto, $83^{\circ} 34'$ from ditto
- 4 At noon, ditto $10^{\circ} 24'$ and ditto, $85^{\circ} 23'$ from ditto
- 5 At noon, ditto $9^{\circ} 47'$ and ditto, $86^{\circ} 29'$ from ditto
- 6 At noon, ditto $8^{\circ} 26'$ and ditto, $88^{\circ} 21'$ from ditto
- 7 At noon, ditto $7^{\circ} 00'$ and ditto, $90^{\circ} 15'$ from ditto
- 8 At noon, ditto $6^{\circ} 24'$ and ditto, $92^{\circ} 50'$ from ditto
- 9 At half an hour after 5 A M saw Pulo Rondo bearing East southerly distance three or four leagues, and Pulo Vray S E b S. Pulo Braffee S S E half S. At noon, latitude $6^{\circ} 15' N$. Pulo Rondo bearing S W b W distance seven leagues. Golden Mount on Sumatra bore S b E.

A DAILY ASSISTANT FROM THE DOWNS TOWARDS CHINA.

S b E half E, and the extreams of Sumatra bore between S W half S and S S E. distance from shore seven or eight leagues.

10 At noon, latitude $6^{\circ} 24' N$. saw the high land of Sumatra from mast-head, bearing between S S W and S W distance 20 leagues.

11 At noon, latitude $6^{\circ} 12' N$. no land in sight.

12 At noon, ditto $5^{\circ} 52' N$. no land in sight.

13 At three P M founded in 57 fathom. At noon, latitude $5^{\circ} 25' N$. the high land of Sumatra bore between S W b S and W b S distance from shore nine or ten leagues.

14 At noon, the extreams of Sumatra bore between S W half S. and W b S distance from shore twelve or thirteen leagues, latitude $5^{\circ} 25' N$. 55 fathom water.

15 At Day-light saw Pulo Terah, from the main top, bearing N b W half W. distance nine or ten leagues, latitude at noon $5^{\circ} 04' N$, the soundings this 24 hours from 52 to 39 fathom.

16 At noon, latitude $4^{\circ} 36' N$ Pulo Terah bore N $35^{\circ} W$ distance seventy-eight miles, 34 fathom water.

At

Daily Assistant from the Downs towards China.

51

Days.
17 At noon, in latitude $4^{\circ} 09' N$, Pulo Verara bore South, distance eleven leagues.

Reference
to the
Appendix.

18 At noon, Pulo Verara bore S W half S. distance four leagues, and the extreams of Sumatra between S b W to W S W, in 40 fathom.

19 In 38 fathom, the Great Sambelong, bearing N E half N. and land on the Malay shore E N E. Pulo Tarro N half E. distance eight or nine leagues.

20 At noon the land of Sumatra bore S S W in 33 fathom.

21 At noon, the Round Arrou bore S W. distance seven leagues, and the extreams of the Malay shore between N E and E half S in 40 fathom water.

22 At six P M the Round Arrou bore $S 57^{\circ} W$ 14 fathom. Then making S E b E course 20 minutes after, the Round Arrou bore $S 81^{\circ} W$, founding between 16 and 18 fathom. We then lost sight of the Round Arrou from the mizon top, and a little after saw Percelar-hill bearing East. At 50 minutes after seven then in 19 fathom; at 8 ditto, saw Percelar hill off the deck, bearing East half North then in 23 fathom: at half past eight, saw

Reference
to the
Appendix.

Days.

- saw the low land off the poop, in 24 fathom; a muddy bottom, at 10 ditto, in 25 fathom soft ground; saw Breakers by the South land from S b E to S b W distance six miles. At noon at anchor, Parcelar hill bearing E N E. distance six or seven miles, a clay bottom, 25 fathom water.
- 23 At noon, Parcelar hill bore N b W half W. Cape Richardo E S E distance six or seven miles, soundings 32, 31, or 30 fathom.
- 24 Anchored in Malacca Road in 9 fathom, the Church bearing N E b E half E, and Fisher's Island N W b W, and the southernmost Water Island, S E b E half E. from shore one and a half miles.
- 25 At anchor, in 18 fathom, Tanjong Thow Point bore E b S half S distance three leagues.
- 26 At noon, Pulo Pisang bore E b S half S, distance four or five leagues, and the Great Carriman S E half S, distance eight or nine leagues.
- 27 At noon, the Great Carriman bore S S E half E. Mount Formosa N N W three quarter W and Pulo Rifang. from S 63° E to S 70° E, distance nine or ten miles in 20 fathom water.

At

Days.
28 At noon, Barn Island bore E b S, the West point of Cocob and Pulo Pifang in one bore N W northerly. Tanjan Bolus Point N b W, the peak of the Great Carriman W S W. three quarters S, and the Northermost Point of the Little Carriman W b S half S, distance from the Malay shore eight or nine miles, in foundings between 16 and 19 fathom water.

29 At seven AM the Trees on Tree Island being in one bore S b E three quarters E. in founding between 16 and 19 fathom water. At eight ditto, the extreams of Tree Island bore between S W b S and S b W three quarrers W. and Red Island S S E easterly; the Rabbit and Coney Islands E b S half S. Barn Island E b S; the northermost part of the Little Carriman, West northerly; distance from Tree Island, four miles; the foundings from 22 to 28 fathom. At half past nine we rounded the Rabbit and Coney in 20 fathom, distance a quarter of a mile, they bore when in one N b E half E; then the Buffaloe rock bore E half S. St. John's Island E N E half N. We had from 28 to 9 fathom, and up to 17, distance from St. John's six or seven miles.

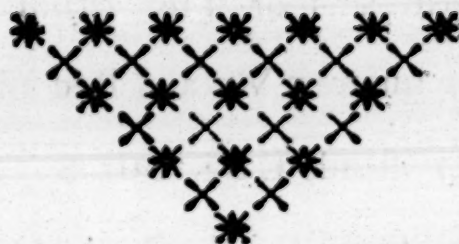
O

When

A DAILY ASSISTANT FROM THE DOWNS TOWARDS CHINA.

Days,

30. When Pedro Blanco bore E b N northerly, then the Benting hill bore S E b S. and the outermost rock on the Reef of Point Romana bore N b E half E, and the Point N half W. The Barbicut hill W N W. distance from Pedro Blanco six miles, in 17, 18, 19, and 20 fathom, soft ground.



Another

Days. Another R E M A R K of the Straights of
Malacca.

I take the southermost of the Nicobar Islands to lay in latitude $6^{\circ} 52' N.$ and longitude $92^{\circ} 55' E.$ from Greenwich. There are good channels between them.

5 The land of Sumatra and Pulo Rounda bearing S W half W. A M the Elephant Mountain bore S b E, and another high Mountain S b W. and Golden Mount W three quarters S. At noon was in the latitude $5^{\circ} 41' N.$

2 At noon, the extrems of the land of Sumatra which are near the shore, and covered with tall trees, from S b E to S W. distance from shore five or six leagues.

The Elephant Mountain bore S b W half W. We sounded with 120 fathom of line, but no ground. Latitude $5^{\circ} 30' N.$

A DAILY ASSISTANT FROM THE DOWNS TOWARDS CHINA.

- 3 At noon, latitude $5^{\circ} 30' N$. It was hazey over the land, but supposed to be distant from shore ten or twelve leagues. We founded but had no ground.
- 4 At noon the Sumatra shore between S half W and W b S. half S. then in latitude $5^{\circ} 35' N$, in 65 fathom water.
- 5 At noon the extrems of the Sumatra shore bore between S b W half W to S W b W half W, the land which we judge to be Diamond Point bore S S W half W. distance ten leagues then in latitude $5^{\circ} 26' N$. in 60 fathom; a muddy bottom.
- 6 At noon, latitude $4^{\circ} 48' N$. the extrems of the Sumatra shore, bore between S b W and W three quarters S, off shore eight or nine leagues; the Inland part of Sumatra shore between S b W. and W three quarters S. off shore eight or nine leagues; the Inland part of Sumatra we have seen this week, part of which is very high and mountainous, but very low near the shore.
- 7 At noon, latitude $4^{\circ} 44' N$, just saw the Sumatra shore from the mast-head, then in 45 fathom fine sand.

At

Days.

8 At noon the extrems of the Sumatra shore between S b W half W and W S W half S. and Pulo Varuray bore S S E three quarters E. distance six leagues in 32 fathom, a blue clay bottom.

Reference
to the
Appendix.

9 At noon the extrems of the Sumatra shore bore between S b W half W. and W b S half S. distance six leagues, and Pulo Varura Y E b S one quarter S. distance three miles; sent the Pinnace ashore for turtle, got none, but found some of their eggs. I take Pulo Varuray to lay in latitude $3^{\circ} 48' N$. we were then in 21 fathom water.

10 Being moderate weather, kept playing to windward, with the tide, and the lead going; at eight P M was much surprized when we had but 8 fathom, a dark sand, but we soon deepened to 10 and a half, then we tacked and stood to the southward, and in a few minutes shoal'd again to 8 fathom. We immediately anchored, and sent boats a sounding round the ship to ascertain the situation of the bank. Pulo Varura bore from the ship $N 17^{\circ} E$ distance nine miles, the northermost of the small islands $N 5^{\circ} E$, the southermost $N 20^{\circ} E$. The bank is six miles in circumference, it deepening to 12 fathom; a hard sand, of a blackish colour; it flows at full and change one hour and twelve minutes.

At.

Reference
to the
Appendix.

11 At six P M the Brothers bore between E b S half S, and S E three quarters E, distance five leagues; and Pulo Varura N half W. The extrems of the Sumatra shore bore between S S E and W S W. At noon saw the Malay shore bearing between N E and E half N, and the Island of Scambalong N b E. In crossing over from Sumatra to the Malay shore, we had one cast eight fathom; but the soundings were mostly between 15 and 30 fathom. Latitude at noon $3^{\circ} 31' N$.

12 We kept plying to windward with the tide: At six P M saw the Arrous from the mast-head, bearing S, distance seven or eight leagues, latitude at noon $3^{\circ} 10' N$.

13 At sun-set the long Arrou bore S W half W and round Arrou S S W and flat Rock S, distance from the Round Arrou three or four leagues. At sun rise the Round Arrou bore S W. At noon it bore W S W, distance five leagues, and Parcelar hill was seen from the poop bearing E b S distance twelve leagues then in 13 fathom.

14 At noon, the Round Arrou bore W $2^{\circ} S$, and Parcelar-hill E $4^{\circ} S$, distance from the Arrous seven leagues, in latitude $2^{\circ} 43' N$, in 24 fathom.

At

Days.

15 At noon, Parcelar-hill bore E, and the extreams of the Malay shore bore from the E half N to E N E. distance from shore four leagues.

Reference
to the
Appendix.

16 At noon, Parcelar-hill bore N 39° E off shore two or three leagues, Cape Richardo E 7° S. Latitude $2^{\circ} 41'$ N.

17 Kept plying to windward with the tide. At ten A M at anchor in 27 fathom water, Cape Richardo bearing E 5° S. distance three leagues; at noon, latitude $2^{\circ} 27'$ N.

18 Kept plying to windward with the tide, the founding was between 27 and 17 fathom.

19 Anchored in Malacca road in 9 fathom water, the Church bearing E b N half N. the southermost of the water Islands S E b S. distance from shore two miles.

20 A M weighed and came to fail.

21 At noon, Water Island bore E S E. distance four or five miles, and the Town of Malacca N three quarters W. Mount Moor E one quarter N. then in 22 fathom. Latitude $2^{\circ} 04'$ N.

At

Reference
to the
Appendix.

Days.

- 22 At noon, Mount Formosa bore E b S half S. and Mount Moor NNE one quarter N, and the outer Water Islands NW half N off shore three or four leagues. Latitude $1^{\circ} 54'$ N. in 20 fathom.
- 23 At noon the westernmost extremity of the land in sight bore N 10° W. Mount Moor N 24° E, and Mount Formosa E, off shore three or four leagues. Latitude $1^{\circ} 48'$ N, in 20 fathom water.
- 24 At noon, Mount Moor bore N b W. Mount Formosa E 18° N. off shore four leagues, in latitude $1^{\circ} 46'$ N. the sounding was between 23 and 27 fathom.
- 25 At noon, Mount Formosa bore N b W. and Pulo Pisang bore E 21° S, the Great Carriman S 33° E, and the Little Carriman S 42° E. off the shore four or five leagues.

N. B. By keeping to the Southward, along the verge of the bank, we carry deeper water and a soft clay bottom, then in latitude $1^{\circ} 26'$ N. the sounding 23 and 24 fathom.

At

Days.

26 At noon Pulo Pisang bore N 10° W distance four or five leagues, and Tanjan Bolus Point E 17° S. and the E end of the little Carriman bore S 28° E. distance three or four leagues, and the peak of the Great Carriman bore S 8° E, then in the latitude $1^{\circ} 22' N$. and the soundings between 17 and 20 fathom.

Reference
to the
Appendix.

27 At sun set the North Point of the Little Carriman bore W $30'$ S the Brothers W half S. Pulo Pisang N 33° W. Tanjan Bolus Point N E three quarters N. Barn Island E three quarters S. distance six leagues. There are many Islands names unknown from the S E to S W. At day-light stood towards Governor's Straights; we passed Sandy Island about a mile distant. We had hard ground from sixteen to eleven fathom; it lays S E, and N W in length about a mile. We passed the Rabbit and Coney Islands; when in one they bore N 23° E, at the distance of three quarters of a mile. At noon the soundings were between thirteen and nineteen fathom; the Buffalo Rock bore E 5° S. distance three miles, and the south end of St. John's Island bore E 33° S.

N. B. The Outermost Island or Coney, and the Little Carriman in one will bear W 5° S. there is anchorage all the way between Barn Island and St. John's Island by keeping to the northward, which

P

is

Days. A DAILY ASSISTANT FROM THE DOWNS TOWARDS CHINA.

is contrary to the general opinion, but it must be hazardous to be forced in a dark night to the southward of Mid-channel on account of the invisible and hidden dangers.

28 We passed a reef of rocks which bore S 10° E to S 38° E. then the peak of the Great Carriman, and the northermost part of Barn Island in one, and St. John's Eastermost extreame point bore N 48° W then in fifty-five fathom. When the extreams of St. John's Island bore between W 7° N and W 3° S. then the East end of Sincapora Island bore NNE, and Barbicut-hill N 50° E. and Point Romana ENE. When we came in sight of the Island off the Reef of Point Romana, we tacked and deepened our water. At midnight passed Pedro Blanco, bearing S b E distance one mile we kept a careful lead going in rounding the Reef of Point Romana.

29 PM our soundings were between fifteen and twenty-four fathom. At six ditto, Benting-hill bore S b W half W. distance six or seven leagues, and Mount Barbicut S W b S seven or eight leagues. At seven AM saw Pulo Aurou bearing NW distance five or six leagues. At noon it bore SW half W distance eight or nine leagues, I take it lays in latitude $2^{\circ} 31'$ N. and longitude

103° 50' E from Greenwich, which I believe is pretty near the truth, as may be proved by the ship's runs and observations in their passages from Madraſs; but time and a little more experience will convince us; for a good obſervation made by the ſun and moon at this Iſland, will confirm it.

Reference
to the
Appendix.

Before I take a departure from Pulo Aurou, it will be neceſſary to give ſome directions which have come to my knowledge this year concerning the Eaſt ſide of the Malay ſhore.

N. B. A ſhip bound to Tringaney muſt obſerve that it does not lay as it is laid down in the Directory, which is 4° 56' N. but it is 5° 25' N. and the name given it in that Chart is Boſſet.

In the month of May when the land winds prevail, it is neceſſary to keep the ſhore on board, and to paſs within Pulo Cappas, and ſoon after you have doubled Pulo Cappas, you will ſee a barren rocky Iſland in ſhore, which you may coaſt along in ſeventeen fathom, and when paſt you may hawl in for the ſhore, into ten, eleven, or twelve fathom; and in ſtanding in for Tringaney, you may anchor in what depth of water you pleaſe. In ſeven fathom you will be three or four miles off ſhore. The river's mouth open, it will bear W or W half N.

Reference
to the
Appendix.

There is also a remarkable large tree about a league to the northward of the river's mouth, which appears like an umbrella, and may be seen with a glass off Barren Island. The soundings when standing in for this coast, we found very irregular, deepening and shoaling from thirty to twenty-four fathom, till we were within twenty fathom, when it shoaled gradually, except just abreast of Pulo Cappas, when we had sixteen and seventeen fathom, and after twenty fathom again.

We took a departure from the Southermost and Eastermost of the Redang Islands, which we take to lay in latitude $5^{\circ} 41' N.$ and longitude $103^{\circ} 28' E$ from London.

I take Pulo Camera to lay in latitude $8^{\circ} 41' N.$ and longitude $105^{\circ} 45' E$ from Greenwich, and I make Pulo Sapata to lay in latitude $10^{\circ} 00' N.$ and by the mean of several observations taken by the sun and moon, I make it lay in longitude $107^{\circ} 53' E.$ from Greenwich.

About two miles to the Eastward of this Island there is a Sunken rock, which was seen in the *Effex*, Captain Jackson ;
there

Days.

there was also another shoal supposed to lay E S E. distance six leagues. Captain Lauder, in the Duke of Gloucester, endeavoured to find it by keeping a good look out at the mast-head, and leads going; they had vast riplings, and a number of birds and large floats of weeds about them, Sapata bore then W 2° N. distance eighteen miles.

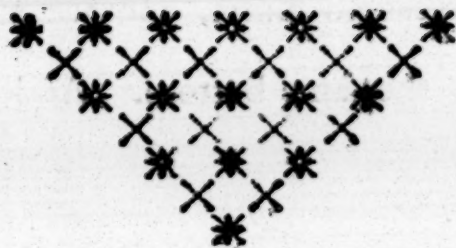
Reference
to the
Appendix.

Being in the latitude 15° 48' N. and longitude 5° E. from Sapata, we having a greater sea than common, we brought to, and sounded, and had ground 123 fathom, whole and broken shells with pieces of coral; we then judged ourselves on the Westermost part of Macclesfield Bank, and we afterwards sounded in seventy five fathom, the same bottom. And in latitude 16° 04' N. had forty-five fathom.

There is another Bank which lays in latitude 19° 15' N, and and is about one degree to the Westward of Macclesfield Bank, it was discovered in the year 1763, by the Le Paix, a French ship, on which there is ten, twenty, thirty, and 40 fathom. In
lati-

Reference
to the
Appendix.

latitude $20^{\circ} 06' N$. At 2 H 49' 32" by making an observation of the sun and moon, we found we were in longitude $112^{\circ} 25' E$. from Greenwich. At midnight we sounded between forty-five fathom and twenty-six ditto, and at six A M saw the Affes Ear bearing N W distance four leagues, and the Great Ladrone W N W. I take the Great Ladrone to lay in latitude $21^{\circ} 57'$, and longitude by observations $111^{\circ} 50'$ from Greenwich.



A Tract from Bengal towards Madrafs.

Reference
to the
Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or ♀. at noon.	Difference	Variation.
1	I took a departure from India, lee road, which I take to lay in 21° 42' N 88° 10' E from Greewich.				
2d day at noon	20 45	88 21	then in 34 fathom.		
♀ 3	20 02	88 21			
h 4	19 44	88 28			
☉ 5	19 06	88 49			
☽ 6	18 22	89 04			
♂ 7	17 50	89 09	89° 42' Corr.	0° 33' E	
♀ 8	17 27	89 00	88 51 Corr.	0 9 W	
1 9	17 04 N	88 39	89 17 Corr.	0 38 E	
♀ 10	16 28	88 25	89 15 Corr.	0 50	
h 11	15 37	87 57	88 35 Corr.	0 38	
☉ 12	14 56	87 06	87 33 Corr.	0 27	
☽ 13	13 55	86 02	86 10 Corr.	0 8	
♂ 14	12 51	85	85 10 Corr.	0 10	
♀ 15	12 58	83 16	82 56 Corr.	0 40 W	
1 16	13 2	81 24	80 48 Corr.	0 36	
♀ 17			80 17 Corr.		
h	At P M. anchored in Madrafs Road.				

As we have not given the Latitudes and Longitudes from Madrafs towards Bengal, I have inferted the above Tract from Bengal towards Madrafs.

A Daily Assistant from BENGAL towards ENGLAND.

I took my departure from Palmera, which is by the entrance of Bengal river, whose latitude is 19° 54' N. and longitude 88° 15' E from Greenwich. When we were in latitude 18° 30' N, and longitude 86° 34' E, we saw the land which bore between W and

W N W

Reference
to the
Appendix.

W N W. distance ten leagues. When the Southermost extream of the land bore W S W, and Sugar Loaf hill N b E, and the Dolphin's Nose N b W half W. we were off shore six leagues. From which I take my departure, allowing it to lay in latitude $17^{\circ} 42'$ N, and longitude $84^{\circ} 2'$ E from Greenwich.

I find by looking at the track, you may fall in with the Island of Apularia; it was seen in the year 1771, bearing W b N distance twelve or thirteen leagues; it appears pretty high and uneven, and seems to extend seven or eight leagues N and S. its latitude $9^{\circ} 30'$ S. and I think by that ship's making the Island of Ceylone that its longitude must be between 84° and 85° E of Greenwich.

The next land seen from the Sugar-loaf was Diego Rays, which bore N N W distance six or seven leagues.

By working home to the Island, by account I made it lay $66^{\circ} 46'$ E of London, but by observing by the $\odot$ and $\sphericalangle$ I found it to lay in $63^{\circ} 10'$ E of Greenwich, by which there was an error in my reckoning of $3^{\circ} 4'$ so that I make the Island of Diego Rais to lie in latitude $19^{\circ} 41'$ S, and longitude $63^{\circ} 10'$ E. of Greenwich. The Island of Diego Rais was viewed by the French, in order to make a settlement on it, but finding a better harbour at the Mauritius, they desisted.

At

At the North end of Island Diego Rais, there is good water to be had, and plenty of fish of several sorts, especially Turtle and Manatte, which are numerous within the breakers on the shelf, round the Island; there is also wood for firing and other uses. The next land seen was the Island of France. When Round Island bore N b W distance eight leagues. Long Island bore N W three quarters W, and Hang Rock W b N half N, then we were in latitude $19^{\circ} 58' S$, and longitude $57^{\circ} 30' E$ from Greenwich. So that I make Fort Louis on the Isle of France to lay in latitude $20^{\circ} 09' 45'' S$ and longitude $57^{\circ} 28' E$ from Greenwich.

When the Island of Bourbon bore between W half N, and W half S. distance about ten leagues; we were then in latitude $20^{\circ} 51' S$. and longitude $56^{\circ} 21' E$. from Greenwich.

Being in sight of the coast of Africa, and it bearing between the North and N W b W. about fifteen leagues distance; then in latitude $31^{\circ} 54' S$. and longitude $29^{\circ} 44' E$. from Greenwich, we saw a smoak of large fires, but no birds nor weeds, nor any sign of soundings, but the next day at two P M had many land birds about the ship; at the same time saw a wide opening between two high steep points of land, which we took to be the entrance into Christian River which bore N b W three quarters W. distance

Reference
to the
Appendix.

thirty miles. At four ditto it bore N half W distance thirty-three miles. So I take the River's mouth to lay in latitude $31^{\circ} 38'$ S. and longitude by observation $28^{\circ} 17'$ E from Greenwich.

Being in latitude $34^{\circ} 30'$ S and longitude $24^{\circ} 00'$ E from Greenwich, the land bearing between the N and N E b N distance from the shore eight leagues, we had soundings sixty fathom gray sand.

When the land bore between N N W and N E b N. distance ten leagues, then in latitude $34^{\circ} 38'$ S. and longitude $24^{\circ} 57'$ E of Greenwich, and in latitude $35^{\circ} 59'$, and longitude $25^{\circ} 41'$ E. we had sixty fathom water, and in latitude $35^{\circ} 28'$ S. and longitude $25^{\circ} 56'$ E. founded in forty-seven fathom. When in latitude $34^{\circ} 48'$ S. and longitude $21^{\circ} 55'$ E, had sixty fathom. In latitude $35^{\circ} 18'$ S. and longitude $21^{\circ} 23'$ E, had sixty fathom.

In latitude 35° S. and longitude $21^{\circ} 40'$ E, had sixty fathom, dark sand. In latitude 36° S. and longitude $20^{\circ} 58'$ E. had ninety ditto, fine gray sand. When Cape Le Gullas bore North Westerly, distant fifty-two miles, had ninety fathom. I take Cape Le Gullas to lay in latitude $35^{\circ} 10'$ S. and longitude $21^{\circ} 20'$ E from Greenwich.

When the land about Falso Cape bore between the N b E half E. and N E b N, then in latitude $35^{\circ} 30'$ S. had sounding 135 fathom, the land seen off the poop. By the above remarks you

may

may have soundings, when Cape La Gullas bears W one quarter N. distance 134 leagues. When the Cape of Good-Hope and Cape Falso are in one, they will bear S 25° E. and you may round the Reef of Green Point, in ten fathom water, and to anchor in the road, you will have nine fathom water.

Reference
to the
Appendix.

To anchor at the Cape of Good-Hope, you may come to in six and a quarter fathom, and moor with the small bower to S W. the Fort S S W half W. Sugar-Loaf W S W half S. the Flag Staff on the Lyon's Rump W b S half S. the Body of Penguin Island N b W half W. The Table Mountain S W. from shore one mile.

When the outermost Point of Penguin Island and the southernmost extremity of the Cape Land are in one they will bear S W. and the Body of the Table Land will bear S three quarters W. then you are distant from Penguin Island two miles. When you take your departure from the Cape of Good-Hope you will follow the former directions.

I take the Island of St. Helena to lay in latitude $15^{\circ} 57' S$, and longitude $6^{\circ} 19' W$ from Greenwich.

Reference
to the
Appendix.

To anchor at St. Helena, come to with the small bower in twelve fathom water half a mile off shore, then the extreams of the Island will bear between E N E, and N W b W half W. and the Flag Staff S S E. and moor with the stream anchor and cable to N N W. When the Turks Cape is in one with the ridge it stands upon, and Barn-House over Barn-Point, distance a mile from shore, there is a shoal which may be seen, it is a quarter of a mile in circumference, and called Barn Ledge, on which was sounded from five fathom to fifteen ditto, between it and the shore is thirty-five and forty fathom. To sail without it, keep George's Island open, or just touching with Sadle-Point, until the Sugar-Loaf is open with Barn-point.

N. B. From the landing-place the bank runs off two and a quarter miles, and deepens gradually to ninety-two fathom, soft ground, and without that no soundings with 130 fathom line.

I take the Island of Ascension to lay in latitude $7^{\circ} 57'$ S. and longitude $15^{\circ} 8'$ W. You may anchor in the road in fourteen fathom water, when the extreams of the Island will bear between S W and N E b E. and the Flag Staff on Cross-hill S b E half E. distant from the landing-place three quarters of a mile. Observed

served the longitude by taking the distance of ☉ and ☽ at this Island, and found it between $15^{\circ} 1'$ and $15^{\circ} 12'$ W. from Greenwich. Variation $10^{\circ} 31'$ W. There is a dangerous spiral rock, on which there is one quarter less three fathom; it lays about two cables length from the Island; when on the Rock, Cross-hill will bear S W half S; six or seven feet from shallowest part there is four or five fathom, and between it and the shore is thirteen fathom, and a little way without it no soundings. There have been remarks made some time ago, that under the equinoctial, and longitude $19^{\circ} 00'$ W. from London there was a dangerous shoal, and likewise a rock, which lays in latitude $11^{\circ} 00'$ N. and longitude $26^{\circ} 20'$ W. and another Reef of Rocks in latitude $17^{\circ} 00'$ N and longitude $29^{\circ} 30'$ W. these want confirmation. The Island of Fugo lays in latitude N. and longitude W. from Greenwich.

Reference
to the
Appendix.

Also the Island of Brava lays in latitude $14^{\circ} 28'$ N. and longitude $24^{\circ} 7'$ W from Greenwich. Those Islands are part of the Cape de Verds. By an observation of ☉ and ☽, I find that the
Island

Reference
to the
Appendix.

Island of St. Maria one of the Western Islands lays in latitude 37° 00' N, and longitude 24° 40' W. from Greenwich. Flores latitude 39° 25' Longitude 30° 54' W from Greenwich. Pico lays in Latitude 38° 40' N. and Longitude 28° 34' W. from Greenwich. Corvo Latitude 39° 54' N, Longitude 30° 58' W.



The

Reference
to the
Appendix.

The following Track is from Madrafs to-
wards the Downs.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation
From Bengal to Madrafs, I refer you to abstract of the out- ward bound passage.					
1	So now we will take our departure from Madrafs Church, which lays in				
at noon.	13° 08' N	80° 10' E	from Greenwich.		
2	13 09	80 26			
☉ 3	13 08	80 29			
☽ 4	12 48	80 47			
♂ 5	11 46	81 19			
♀ 6	11 06	81 36			
♂ 7	10 28	81 39			
♀ 8	9 49	82 19			
♂ 9	9 00	82 19			
☉ 10	8 22	82 19			
☽ 11	7 32	82 33			
♂ 12	6 22	83 52			
♀ 13	4 54	84 27			
♂ 14	3 42	85 47			
♀ 15	2 52	86 48			
♂ 16	2 14	87 16			
☉ 17	1 56	87 30			
☽ 18	1 59	87 13			0° 57' E
♂ 19	1 32	87 22			
♀ 20	1 19	87 22			
♂ 21	1 02	86 41			
♀ 22	0 8	86 35			1 09
♂ 23	0 46 S	87 11			
☉ 24	1 10	86 56			
☽ 25	1 36	86 48	87 32	Corr.	0 44 E
♂ 26	2 54	86 32	87 16		0 43

A DAILY ASSISTANT FROM MADRASS TOWARDS THE DOWNS

Reference
to the
Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or ♀. at noon.	Difference.	Variation.
☿ 27	4° 03' S	86° 08' E	86° 52'		
♀ 28	5 09	85 54	86 38		
☿ 29	5 32	85 53	87 36	Corr.	1° 43' 0° 12' W
☉ 30	6 12	85 52	87 35		
☽ 31	6 34	85 24	87 07		
☿ 32	7 43	84 41	86 21		
☽ 33	9 16	83 07	84 59		0 47
☿ 34	10 09	81 46	83 29	Corr.	1 43
♀ 35	10 53	79 58	81 41		
☿ 36	11 39	78 21	80 04		
☉ 37	13 11	76 40	78 23		
☽ 38	15 01	74 58	76 41		
☿ 39	16 48	73 24	70 52	Corr.	2 32 W
☽ 40	18 03	72 19	70 38	Corr.	1 41
☿ 41	19 27	71 09	68 49	Corr.	2 20 6 00
♀ 42	20 00	69 15	66 55		9
☿ 43	20 20	68 13	64 03	Corr.	4 11
☉ 44	19 44	66 34	saw Diego Rais bearing W N W. distance ten leagues at 10 A.M. whose latitude I imagine to lay in from Greenwich.		
☽ 45	19 44 S	63 10 E			
☽ 46	19 41	60 53			
☽ 47	20 21	59 18			
☽ 48	19 58	58 43	The Isle of France in sight.		
☽ 1	Anchored in the Harbour.				
☽ 1	Came to sail from the Isle of France.				
☉ 2	20 57	56 21			
☽ 3	21 22	54 45			16 26
☽ 4	22 32	53 56	54 15	Corr.	0 19 E 17 0
☽ 5	22 35	53 19	53 27	Corr.	0 8
☽ 6	23 12	51 49	51 45	Corr.	0 4 W 17 56
☽ 7	24 28	50 39			18 41
☽ 8	26 01	49 09	48 09	Corr.	1 ditto

A DAILY ASSISTANT FROM MADRASS TOWARDS THE DOWNS.

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Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or *, at Noon.	Difference	Variation.
☉ 9	27° 03' S	47° 03' E	45 32 27 Corr.	1 30 33 W	
☽ 10	27 45	45 17	43 52 39 Corr.	1 24 21	
♂ 11	28 01	43 04	41 40		
♀ 12	28 31	40 58	39 32		
♂ 13	29 14	39 34	37 51 Corr.	1 43	25 9 W
♀ 14	9 53	38 30	35 50 Corr.	2 40	25 44
♂ 15	31 15	35 56	32 29 Corr.	2 27	23 44
☉ 16	31 05	34 38	31 10		
☽ 17	31 38	33 48	30 15 Corr.	3 33	
♂ 18	32 10	33 33	28 35 Corr.	4 58	23 59
law the land of Africa.					
♀ 19	34 26	32 17	27 19		
♂ 20	35 18	30 06	23 58 Corr.	6 08	
♀ 21	34 36	30 21	24 13		
♂ 22	34 38	30 25	24 57 Corr.	5 28	We saw
land					
☉ 23	35 27	30 41	25 10		
☽ 24	35 39	31 11	25 35		
♂ 25	36 03	29 57	21 06 Corr.	8 51	Ground
ninety-five fathom, saw the land.					
♀ 26	36 03	29 49	20 58		
♂ 27	35 01	30 27	20 53		
♀ 28	35 00	30 31	21 40		
At 4 P M saw Cape					
Le Gullas bearing N W distance five leagues					
♂ 29	35 21	30 33	21 42		22 17
☉ 30	35 57	29 51	21		A M had 75 fathom.
☽ 31	35 23	28 11	19 20		21 45
♂ 32	35 57	26 41	17 48 Corr.	8 53	
♀ 33	34 39	25 12	16 19		
♂ 34	32 38	23 28	13 18 Corr.	10 10	
♀ 35	31 15	3 03	12 53		
♂ 36	30 16	3 3	13 03		
☉ 37	28 45	23 3	12 37 Corr.	10 36	18 03
☽ 38	28 37	22 02	11 19 Corr.	10 3	

Reference
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Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation.
♂ 39	27° 12' S	20' 02' E	9° 19' E		17° 15' W
♀ 40	25 30	18 01	7 25 Corr.	10° 36'	17 03
♂ 41	23 40	15 43	5 07		
♀ 42	22 00	13 43	3 07		
♂ 43	19 51	11 59	0 52 Corr.	11 7	14 45
☉ 44	17 39	9 56	2 18 W Corr.	12 14	14 35
☽ 45	16 18	8 18	3 56 Corr.	12 14	13
♂ 46	15 55	6 16	5 58		saw the Island of St. Helena, bearing W b N. distance seven eight or leagues, went into the Road, and there anchored.
☉ 1	Sailed from St. Helena.				
☽ 2	15 01 S	6 47 W			
♂ 3	13 49	7 59			
♀ 4	12 33	9 17			
♂ 5	11 03	10 36			
♀ 6	9 34	12 17			
♂ 7	8 06	13 23			Saw the Island of Ascension bearing W N W distance six leagues.
☉ 8	7 57	15 08			
☽ 9	7 48	15 14			
♂ 10	6 01	16 30	16 27 Corr.	0° 3' E	
♀ 11	4 22	17 36			10° 31
♂ 12	2 31	18 22	18 40 Corr.	0 18 W	
♀ 13	0 17	19 05	19 23		8 52
♂ 14	1 40 N	19 45	20 43		8 22
☉ 15	2 56	20 16	20 39 Corr.	0 23 W	7 51
☽ 16	4 22	20 42	21 05 Corr.	0 23	6
♂ 17	6 03	21 13	20 48 Corr.	0 25 E	5 18
♀ 18	7 33	21 46	21 21		
♂ 19	8 06	22 04	21 39		
♀ 20	9 23	22 01	21 46 Corr.	0 15 E	9
♂ 21	9 32	22 06	20 30 Corr.	1 36	
☉ 22	9 50	22 21	21 16 Cort.	1 05 E	
☽ 23	10 58	23 05	22 00		
♂ 24	11 29	23 19	21 19 Corr.	2 00 E	9 56
♀ 25	12 09	24 05	22 05		
♂ 26	13 06	25 23	23 14 Cor.	2 09 E	10 15

A DAILY ASSISTANT FROM MADRASS TOWARDS THE DOWNS.

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Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation.
♀ 27	14° 19' N	26° 13' W	24° 04' W		
h 28	14 26	26 44	24 35 Corr.	2' 9' E	Saw land supposed to be Fugo and Brava.
☉ 29	15 47	28 08	25 59		
☽ 30	17 29	30 02	27 53		9 00 W
♂ 31	19 20	31 37	29 28		8 35
♀ 32	21 24	32 59	30 50		
♂ 33	23 40	34 45	32 36		8 37
♀ 34	25 22	36 59	35 12 Corr.	1 47 E	9 00
h 35	27 18	38 48	36 38 Corr.	2 10	
☉ 36	29 15	40 32	38 44 Corr.	1 48	
☽ 37	29 50	40 49	38 17 Corr.	2 32	
♂ 38	29 52	41 01	38 24 Corr.	2 37	
♀ 39	30 34	40 39	38 14 Corr.	2 25	
♂ 40	31 35	40 02	37 32 Corr.	2 30	
♀ 41	32 26	41 00	38 36 Corr.	2 24	
☽ 42	33 35	40 53	38 28		8 40
☉ 43	34 50	39 37	36 59 Corr.	2 38	
☽ 44	35 58	40 09	37 31		
♂ 45	37 50	39 17	36 39		
♀ 46	39 42	37 03	34 25		
♂ 47	39 59	35 52	33 14		
♀ 48	39 37	36 32	33 54		
h 49	39 51	35 37	33 51 Corr.	1 46	14 35
☉ 50	40 29	36 11	33 15 Corr.	2 56	15 49
☽ 51	42 47	34 38	31 44		
♂ 52	44 34	31 43	28 49		15 46
♀ 53	45 48	29 00	26 34 Corr.	2 26	
♂ 54	46 55	25 47	22 56 Corr.	2 51	
♀ 55	48 05	22 15	19 34 Corr.	2 41	
h 56	48 24	19 55	17 26 30" Corr.	2 28	21 33
☉ 57	49 20	16 12	13 44		
☽ 58	49 33	12 22	9 54		
♂ 59	49 21	9 51	7 23		
♀ 60	49 21	7 47	5 47		

At ten P M saw the Lizard Lights bearing N E b N distance seven or eight leagues

Reference
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Weeks. Days.	Latitude in at Noon.	Longitude by account at noon	Longitude by ☉, ☽ or *. at noon.	Difference	Variation.
At ten A M took my departure from St. John's Point, whose latitude is 20° N. the Point is about half way between Bombay and Surat At noon it bore N 55° E. distance ten leagues, then in latitude 19° 45' N.					
☉ 1	19° 45' N	St. John's Point N. 55° E.			
☽ 2	18 24	1 39 W			
☿ 3	17 24	2 48			
♄ 4	16 46	3 23			3° 01' W
♃ 5	16 07	4 12			2 3
♀ 6	15 32	4 40			2 30
♂ 7	15 09	5 17			2 20
☉ 8	14 27	6 37			2 50
☽ 9	13 45	7 51			3
☿ 10	13 06	8 52			3 40
♄ 11	12 52	9 32			4
♃ 12	12 34	10 12			4 30
♀ 13	12 03	11 08			4 30
♂ 14	11 48	12 00			
☉ 15	11 17	13 06			5 50
☽ 16	11 19	14 12			6 38
☿ 17	11 16	14 31			6 50
♄ 18	11 18	14 40			6 50
♃ 19	11 11	14 55			7 00
♀ 20	11 01	15 24			7 00
♂ 21	10 54	15 50			7 00
☉ 22	10 56	16 31			7 20
☽ 23	11 06	16 49			7 30
☿ 24	11 18	17 14			7 40
♄ 25	11 43	18 10			8 00
At noon the Island of Abdelary bore from NE b E to NE half E twelve leagues. Cape Guardafoy W three quarters N. off shore eight leagues; the Island is six leagues more to the Eastward than Mr. Herbert lays it down in his charts. 9 3					
♄ 26	12 9	Mount Felix bore from S b W. to S S W distance five leagues. 9 25			
♀ 27	11 54	Cape St. Peter bore South the White S b E off shore seven or eight leagues. 9 3			
♂ 28	11 32	The Island of Mette bore S three quarters E. distant five leagues. 10 00			
The Latitude of the Island of Mette 11° 17' N.					
☉ 29	11 36	At seven saw Bird Island bearing S W b W from Mast-head distant about six leagues.			

Bird Island bears from the Island of Mette S 73° W. distance twenty-three leagues. At noon Bird Island bore S. 87° E. distance six leagues. Its latitude is $11^{\circ} 20'$ N. and $3^{\circ} 13'$ W from Mount Felix.

Reference
to the
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♂ 30 Latitude $12^{\circ} 29'$ Bird Island S 53° E thirty-eight leagues.
Variation $10^{\circ} 50'$

♀ 31 Latitude $12^{\circ} 24'$. At ten A M founded, had forty-four fathom, coarse sand, and shells with green ouze. At noon Cape St. Anthony bore N W half W. Cape Aden E b N, distance fourteen leagues, which are the extrem points of the land, distance from shore four leagues. I make Cape Aden to bear from Bird Island N 56° W. distance forty-six leagues; the latitude of Cape Aden $12^{\circ} 37'$ N. Meridian distance from Bird Island $1^{\circ} 53'$ W. Difference Latitude $1^{\circ} 17'$ N. Soundings at noon forty-two fathom, fine sand.

h 32 At sun-rise Cape Babelmandell bore N W three quarters W. The island of Babelmandell bore N W b W. half W. Cape St. Anthony E. the extreams of Ethiopian shore

Reference
to the
Appendix.

shore from W to S W b S ; distance from Babelmandell three leagues, and sounding twenty-four hours, was between forty-two and twenty-four fathom.

- 33 At nine A M entered the Straights of Babelmandell, at ten got through, the least water we had was eight fathom. At noon the body of the island Babelmandell bore S b E. and the body of Cape Babelmandell S S E Easterly, distance five or six leagues, Dubab E N E Cudder N E Easterly, distance off shore three or four leagues. Latitude by observation at noon $12^{\circ} 46' N$.

- 34 At three P M the Great Mosque on Mocha bore N N E at sun-rise the Mosque bore S half E, the Fort S half W, the ships in the Road from S b W to S W half S, distance five miles ; at noon anchored in the road in eleven fathom water, the Great Mosque S E b E, and the Southermost Round Fort S S E distance from the Town four or five miles.

Lati-

Days.

A DAILY ASSISTANT FROM MOCHA TOWARDS BOMBAY.

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1 Latitude at noon was $12^{\circ} 32' N$. Cape St. Anthony bearing
N N E. distance four leagues, in thirty-five fathom, from which
I took my departure, bound to Bombay.

2 At four P M Cape St. Anthony bore N N W three quarters
W. distance nine or ten leagues. I reckon it to lay in latitude
 $12^{\circ} 37' N$.

3 At noon.
In latitude $12^{\circ} 26' N$. Long. $3^{\circ} 48' E$. Variation $10^{\circ} 15' W$.

4	12 50	5 19	10 50
5	13 36	6 8	9 30
6	13 36	8 15	8 40
7	14 08	10 19	
8	14 54	12 32	
9	15 50	15 06	4 35
10	16 37	17 32	
11	17 53	19 27	
12	18 53	21 09	
13	18 56	22 36	1 35

at noon fifty-four fathom.

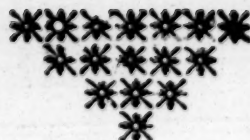
14 18 58 23 57 at noon 44 fathom.

At

A DAILY ASSISTANT FROM MOCHA TOWARDS BOMBAY.

At half past five A M saw the land ; at six ditto the Light-house on Old Woman's Island bore E b N. the greatest Carranger E one quarter N. At noon anchored in one quarter less seven fathom, the Flag Staff on Bombay Fort N b W half W.

Light-house on Old Woman's Island S W half W. Hunary and Kanary S half W. Cross Island N b E half E. distance off Bombay half a mile.



Reference
to the
Appendix.

The following Track is from Bombay to the
Cape of Good-Hope.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or ♀. at Noon.	Difference	Variation
♀ 1	I took a departure from Old Woman's Island, allowing it to lay in 19° 00' N 73° 06' E from Greenwich.				
at noon.	18 11	71 33			
♂ 2	17 07	69 50			1° 35' W
♀ 3	16 21	68 19			2 10
h 4	14 53	66 39			2 40
☉ 5	13 35	65 7			4 00
☽ 6	12 20	63 17			4 00
♂ 7	11 19	61 40			5 30
♀ 8	10 31	59 58			6 00
♂ 9	9 55	58 18			7 20
♀ 10	9 09	57 26			7 20
h 11	8 33	56 50			8 00
☉ 12	7 54	53 53			8 20
☽ 13	7 07	54 37			9 20
♂ 14	6 36	53 09			10 10
♀ 15	4 42	52 08			11
At noon the extreame of the land of Africa bore between N half E and W. distance off shore seven leagues; the land appeared very low, just to be seen above the surface of the water, though very clear. I think it a dangerous coast to make in the night, as you will be near the shore before you see land, and when you do see it, it appears like sand-hills.					
♂ 16	Took a departure from land, as it was seen yesterday noon, allowing it to lay in				
at noon	4 42	50 0			12 25
♀ 17	2 12	49 30			12 25
h 18	0 20	48 24			13 10
☉ 19	1 31 S	47 23			13 30
☽ 20	3 00	46 46			15
	4 15	46 05			15 20
Sounded in the night for the Patron shoal, but no ground.					

A DAILY ASSISTANT FROM BOMBAY TOWARDS THE CAPE
OF GOOD-HOPE.Reference
to the
Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or *, at Noon.	Difference	Variation.
♂ 21	5° 20' S	45° 49' E			16° 20' W
♀ 22	6 08	45 34			16 30
♂ 23	6 52	45 23			17 15
♀ 24	7 31	45 18			17 20
♂ 25	7 47	45 18			18 14
☉ 26	8 43	45 18			18 14
☽ 27	9 56	45 27			19 14
♂ 28	10 57	45 48			20
At noon the extremities of land seen from the mast-head bore between S W b S and N W, and the land seen from the Poop bore between W b N half N and W half N, distance six or seven leagues, and appears to be an Island.					
N. B. I find in making the land that we are 3° 22' W of Account or it is more to the Eastward than what is laid down in Herbert's Draughts.					
♀ 29	12 30	47 24			20 15
Took a departure from the land seen yesterday, and allowing it to lay in latitude 10° 57' and longitude 46° 23' from the Lizard; the land appeared like four Islands, with white sandy beach, and full of trees.					
♂ 30	14 36	47 52			20 40
♀ 31	16 49	47 44			21 00
♂ 32	18 57	47 34			21 30
☉ 33	19 40	47 25			
☽ 34	19 49	47 27			22 40
♂ 35	19 43	47 22			23 30
♀ 36	19 51	47 00			23 30
♂ 37	20 41	46 30			23 30
♀ 38	no obser-	46 17			laying o
♂ 39	vation.	45 52			Sounded
supposing ourselves nigh Bassas de India, keeping a good Look-out, and lead going.					

A DAILY ASSISTANT FROM BOMBAY TOWARDS THE CAPE
OF GOOD-HOPE.

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Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or * at Noon.	Difference.	Variation.
☉ 40	23° 05' S	46° 07' E			
☽ 41	23 22	47 11			24° 0' W
♂ 42	23 42	46 47			24 20
♀ 43	23 59	46 44			24 30
♂ 44	25 02	45 52			24 40
♀ 45	26 27	46 09			26
♂ 46	27 44	44 49			26
☉ 47	29 26	44 35			
☽ 48	31 30	44 14			25 02
♂ 49	33 12	43 56			35 30
♀ 50	35	42 15			35 40
♂ 51	35 33	42 21			
♀ 52	35 45	42 53			
♂ 53	35 35	42 57			
☉ 54	36 05	42 26			26 0
☽ 55	36 29	41 50			25 30
♂ 56	36 23	41 22			26 30
♀ 57	36 22	39 26			
♂ 58		38 40			
♀ 59	36 02	38 31			26 00
♂ 60	36 06	38 57			
☉ 61	35 24	38 35			
☽ 62	35 10	37 02			26 30
♂ 63	35 38	35 57			
♀ 64	36 01	35 57			26
♂ 65	36 08	34 59			25 45
♀ 66	35 21	32 33			24 05
♂ 67	35 27	31 02			24 06
☉ 68	34 57	28 52			22 06
Sounded in fifty-eight fathoms.					
☽ 69	34 36	27 02	At noon Cape Frio bore E S E. and Cape Bona Esperance E half N, the northernmost extrem N half W off shore about four leagues,		
					21 00

From Bombay along the Coast of Malabar.

- 1 We took our departure from the Flag Staff of the Fort of Bombay whose latitude is $19^{\circ} 00' N$ and longitude $73^{\circ} 06' E$. from Greenwich. At noon the look-out house on Old Woman's Island bore West two miles and a half.
- 2 At noon the extreams of the land bore between $N 42^{\circ} E$. and $S 45 E$. and the Island of Rajapore bore $N 65^{\circ} E$ distance about five leagues; the latitude in $18^{\circ} 20' N$ in nineteen fathom.
- 3 At noon the extreams of the land bore between N and $S E b E$. distance off shore five or six leagues, the latitude $17^{\circ} 50' N$. In twelve fathom and a half.
- 4 At noon the extreams of the land bore between N half W and SSE off shore three leagues. Then the Flag staff of the Fort of Gariak bore $SE b S$ in latitude $16^{\circ} 34' N$.
- 5 When the extreams of the land bore between NNE and $E b S$ half S and Vinegar la Rock NE . distance eight leagues, and at noon when the extreams of the land bore between $N 25^{\circ} E$. and South $70^{\circ} E$. from shore thirteen leagues, No Ground with thirty-five fathom line. Latitude in $15^{\circ} 30' N$.

Anchored

6 Anchored in Goa Road in five fathom water. Algarda Fort bore N 60° E distance two miles.

Reference
to the
Appendix.

7 At noon the extrems of the land bore between N 5° E and S 3° E distance from shore five leagues, then nineteen fathom water. St. George's Fort bore N N E four leagues.

9 At noon the extrems of the land bore between N and S E b S and Pidgeon Island bore S E b S distance four leagues. The nearest part of the coast was distant from us seven leagues, twenty-five fathom water. Latitude 14° 10' N.

10 At noon the extrems of the land bore between N N E and E S E distance from shore twelve or thirteen leagues, in twenty fathom. Latitude in 13° 18' N.

11 At noon the extrems of the land bore between N 12° E and S 40 E, and the Mallapy-hill N 48° E, and Barn-hill N 88° E, distance from the latter three leagues in 17 fathom, and in latitude 12° 38' N.

12 At noon the extrems of the land bore between the N and S E b E and Mount Dilla N N E half E distance five leagues, in twenty-five fathom, latitude 11° 48' N.

At

Reference
to the
Appendix.

Days.

- 13 At noon anchored in five fathom water. Mount Dilla bearing N 45° W and the Southermost extream S 40° E and the Flag Staff of Tillichery Fort N 25° E distance from shore three miles.
- 14 At noon at anchor, when the extreams of the land bore between the N W b W and S E b S distance from shore four leagues, and the Flag Staff of Tillichery N N E half E. In latitude $11^{\circ} 39'$ N in nine fathom and a half.
- 15 At noon the extreams of the land bore between N 21° W and S 39° E and the Flag Staff of Calcutt bore N 70° E distance six miles, in ten fathom, the latitude $11^{\circ} 15'$ N.
- 16 At noon the extreams of the land bore between N 38° W and S 72° E distance from shore six leagues, in seventeen fathom water. Latitude $10^{\circ} 17'$ N.
- 17 At noon at anchor in six fathom and a half water, when the extreams of the land bore between N 8° W and S 20° E and the Flag Staff of Cochin Fort bore N 85° E distance four miles, then in latitude $9^{\circ} 57'$ N.
- 18 At noon in latitude $9^{\circ} 23'$ N, and in forty fathom water.

At

19 At noon the extrems of the land bore between N N E, and S E off shore five leagues, and in latitude $9^{\circ} 41' N$, in 13 fathom water.

Reference
to the
Appendix.

20 At noon the extrems of the land bore between N 27° E and S $60'$ E and Quelon bore S 85° E off shore six leagues, then in twenty-five fathom, and latitude $8^{\circ} 57' E$.

21 At noon the extrems of the land bore between N N E, and S E half S. and the Flag Staff of Anjango bore N b E half E off shore five or six miles, then in latitude $8^{\circ} 34' N$.

The latitude of Anjango is $8^{\circ} 39' N$ and longitude $77^{\circ} 31' E$ of Greenwich.

By a good observation of the Sun and Moon, the longitude of Cape Cameron is $78^{\circ} 39' E$ and latitude $7^{\circ} 50' N$.

When Cape Cameron bears E distance ten leagues, then you will have fifty fathom water, black and brown sand, with shells intermix'd.

Another

Reference
to the
Appendix.

Another Remark from Bombay along the Coast of Malabar.

Bombay is in latitude $19^{\circ} 00'$. Hanary Canary is in latitude $18^{\circ} 51'$, and lies from the Fort S b W half W, eleven miles distant. You anchor in Goa Road seven fathom and a half, soft ground, the Westernmost land in sight bearing N three quarters W, and a Light-house like a lanthorn standing on the top of the hill within the Fort on the Alguarde E b N half N, or the going in of the River's Mouth E half N.

From Goa to Carwar the Coast S E. distance twelve leagues. You anchor when the Rocks of Carwar called Duckey, bear N NW half N, and a small Rock in the Road open with the Island India Diva N b W half W, distance two leagues; or you may anchor abreast of India Diva, the body bearing N E b E about two miles and a half off, in ten fathom and a half, and the S Point of Carwar N b E. The passage into Carwar Bay is between Craggy Rocks, alias Duckey, and the Island near the South Point, in which Bay

in

on the South-side is a small cove, the entrance into which is S E one quarter E. In this cove small ships may ride very securely, land locked. Near the mouth or entrance into it is four fathom water; there a ship may ride it out the whole Westerly Monsoon without any great danger. Note, You may go in or out on either side of Duckey rocks, these being in the N W or S E channel, seven or eight fathom, oazy ground.

Reference
to the
Appendix.

From Calwar to Calicut, the course is S S E, distant about seventy leagues, latitude $11^{\circ} 00' N$. When Calicut bears N E b N. about three leagues distant, you will have thirteen fathom, oazy ground. You may see the town at this distance with a prospect glass, wherewith it appears fair and large: and to the northward of it are three white spires standing at an equal distance one from the other by which this place may be known.

You may anchor in Calicut Road in five fathom, soft oazy ground, the four tombs to the northward of the town bearing E N E one quarter N, and the northermost land in sight, which makes like Islands N b W half W you being about two or three miles off shore.

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Reference
to the
Appendix.

In latitude $11^{\circ} 29' N$, lye the Sacrificed Rock N E b E. A mile and a half from it is fifteen fathom water, oazy. This Rock is about a league from the shore, it is only a stone Reef, and reasonably high, it may be seen at least four leagues off, and it is thought safe for any ship to sail between it and the Main. The course from the Sacrificed Rock to Cochin is S S E. distant thirty-three leagues. The city of Cochin lies in latitude $9^{\circ} 56'$. As you come from the Southward, it makes but a small show only a few houses at the north-end with a Flag Staff, and wind-mills to be seen; the other part is hid with trees within the wall, which wall at a distance seems to be the bounds of the shore; the land both to the Northward and Southward is low and full of trees. Up in the country is high land, but commonly covered with clouds, and if not, is no ways remarkable: On the north side of the city is a Reef of sand, which stretches about half a mile from the shore, the water shoaling gradually to three fathom and a half, and just without the Reef is oazy ground; a ship of any burthen may ride in six or seven fathom, about two miles from the shore, bring the town to bear E N E or N E b E or the Windmill or Flag Staff shut in one.

When

When you are to the Northward of the city, it makes a grand appearance. The river shews like a very fine one, but is not at all safe at any time. At spring tides there is fourteen feet water on the bar, and it ebbs not above four feet. Provisions are here very plenty, as Hogs, Poultry, and Ducks, which are very good; also here are Cows, but very small and lean. From Cochen to Anjengo, the course is S S E, distant sixty miles, which lies in latitude $8^{\circ} 50'$. You may anchor in eleven fathom, the Flag Staff bearing N N E, and the northermost land in sight N N W half W, or you may anchor with the Flag Staff N E half N. and the northermost land in sight N N W half W about two miles off shore.

Reference
to the
Appendix.



Reference
to the
Appendix.

General Instructions for failing from the Island of Ceylone towards Bombay in the North Easterly Winds.

Note, When you see Point de Galla whose latitude is $60^{\circ} 00'$ N, and longitude $80^{\circ} 10'$ E from Greenwich.

You must keep in twenty-four fathom by day, and thirty by night; for to the Southward of the said Point runs off a ledge of Rocks, about a mile and a half into the sea; as soon as you have doubled the said Point de Galla, there being no other danger, you ought to keep the shore close on board, till you come up as high as Columbo which is the chief place on the Island, it lies in the latitude of about 7° N; before you cross over for Cape Camaron, for the North Easterly winds blow fresh, and the current between Tuttacorine, and Ceylone sets extraordinary strong to the North
West-

Westward. If by any shifts of wind, or occasion of the current setting out of the Bay of Bengal, or any accident you fall in with the South end of Ceylone, or the West side as high as Columbo or thereabouts, there is no danger; for you may boldly come near it in two fathom water; but as the S W Point of the Island lies in $5^{\circ} 50' N$. you ought to have a great care to make the Island, if possible, on S E side, or otherwise it may happen that the current which sets strong to the Westward, may occasion the loss of your passage.

From Columbo you must steer N W to get sight of Cape Cameron, which lies in $7^{\circ} 42' N$. Latitude N. The Cape is to be known at a great distance by several high mountains, which lies to the North Eastward of it; the pitch of the Point itself is very low land. As you come near it, you ought to look out for two rocks, which lie at the South West part of the said Cape: You may also know this Cape by a single high mountain, which is right over it, and under that stands a great range of trees of an equal height. You may sometimes find it difficult to double Cape Camaron though you have it close aboard by reason of the wind,
and

Reference
to the
Appendix.

and a current that sets to the Southward ; but you must take the opportunity when the currents are not against you, and anchor from thirty-five to forty fathom until night, when the wind will come about to the E and E N E, for in the day-time near this Cape the wind is always North. When you are past the Cape, you ought to keep the shore as close aboard as you can in twelve fathom, there anchor again, minding always not to be under sail while the tide of ebb sets to the Southward.

The next remarkable place to the Northward is a late English factory called Anjengo, it lieth in latitude as before described, and is a little shore of Quelon which belongs to the Dutch, whose latitude is about 9° N, and may be known by their colours, with a grove of high trees which stand directly over the port ; before which lies the road of Quelon, but there is a ledge of rocks before it that must be avoided by coming no nearer the shore than in twelve fathom water, sandy ground, and there you may anchor and wait for the land breeze, which commonly springeth up towards midnight,

night, and with the first of it you must make sail, taking care not to exceed thirty fathom in the Offing, and there anchor again, and when the sea breeze comes, weigh and stand into seven fathom foft ground where drop again.

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Note, Between Quelon and Cochin you ought not to exceed the depth of twenty-four fathom in the Offing, but anchor in that depth to stay for the sea-breeze to bring you into the shore again, and then you will have the benefit of the land breeze, which will spring up in the night.

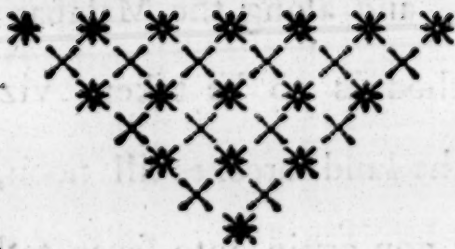
From Cochin and Goa, and along the Malabar coast as high as Bombay, the same method is to be taken, viz. From about midnight stand off with the land breezes till noon, at which time the sea-breezes will carry you again into seven fathom, foft oazy ground, and there you anchor, always minding not to exceed twenty fathom in the Offing, carefully observing whether the tide be for, or against you, and making your utmost endeavour every evening to be near in with the land, and every forenoon off from

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it in the afore described depths, in doing of which you will reap the advantage of both land and sea-breezes.

To the North Westward of the entrance of Bombay road lies a ledge of rocks, which reacheth to the river of Basseene or Bassene, and lies in the latitude of $19^{\circ} 35' N$.



A DAILY ASSISTANT FROM BOMBAY TOWARDS THE DOWNS.

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Appendix.

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or ♀. at noon.	Difference	Variation.
I took my departure from Anjengo, allowing it to lay in					
at noon	8° 39' N	77° 31' E			
h 1	8 43				
☉ 2	7 53				
☽ 3	7 08				
♀ 4	6 34				
♀ 5	5 00				
♀ 6	3 30	74 54	74 40	Corr.	0° 14' W
♀ 7	3 13		74 57		
♀ 8	2 17		75 43		
h 9	1 01		76 11		
☉ 10	0 29 S	80 44	76 56	Corr.	3 48
☽ 11	2 11	80 39	77 26	Corr.	3 13
♀ 12	3 50	77 06			
♀ 13	5 29		76 48		
♀ 14	7 29		76 48		
♀ 15	9 55		76 33		
h 16	11 26		76 11		
☉ 17	13 00		75 23		
☽ 18	13 24		75 12		
♀ 19	13 48		75 00		
♀ 20	14 14	77 47	77 20	Corr.	0 27
♀ 21	14 50	77 20	76 01	Corr.	1 19
♀ 22	15 28		75 26		3° 20' W
h 23	16 32	75 43	74 10	Corr.	1 33
☉ 24	17 45	73 56	72 27	Corr.	1 29
☽ 25	18 52		70 30		
♀ 26	19 43		67 35		11 38
♀ 27	20 38		65 13		
♀ 28	21 31		63 28		
♀ 29	22 08		62 21		11 26
h 30	22 22		61 47		13 18
☉ 31	23 09		59 23		
☽ 32	24 04		56 48		
♀ 33	25 07		54 51		8 50
♀ 34	25 50	54 48	50 23	Corr.	4 25
h 35	26 18		49 42		21 35
☉ 36	27 52		50 35		21 35
☽ 37			48 39		24

Reference
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Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation.
☉ 37	28° 27' S		46° 45'		24° 55' W
☽ 38	29 32	47° 06'	42 04	Corr.	5° 2'
♂ 39	30 09		39 21		25 40
♀ 40	30 32		36 26		
♂ 41	30 48		35 19		
♀ 42	30 54		34 52		
♂ 43	31 05		32 18		26
☉ 44	31 15		31 21		26 20
☽ 45	31 33		29 51		26 45
♂ 46	33 09		27 50		
♀ 47	34 57		25 40		24 30
♂ 48	34 37		24 56	Corr.	Struck Ground, 80
♀ 49	34 30	fathom, the coast of Africa in sight			23 30
♂ 50	34 32		25 40	Corr.	foundings 60 fathom
☉ 51	35 37		25 26		Land 23 36
☽ 52	35 31	27 37	25 07		Land
♂ 53	35 15		21 27	Corr.	6 10
♀ 54	34 22		19 42		Land 21 40
At one P M Cape Le Gullas bore N E half E. distance fix leagues.					
♂ 55	Came to anchor in Table Bay.				
	Took our departure from Table Bay, allowing it to lay as before specified				
♂ 1	34 22	17 40	from Greenwich.		
☉ 2	30 36				20 6
☽ 3	28 59	11 59	12 10	Corr.	0 11
♂ 4	27 36	10 37	10 57		10 09
♀ 5	26 40	9 18	9 40	Corr.	0 22
♂ 6	25 50		8 51		18 13
♀ 7	25 03		7 50		18 40
♂ 8	23 50		6 06		17 50

A DAILY ASSISTANT FROM BOMBAY TOWARDS THE DOWNS

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Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation.
☉ 9	22° 25' S		4° 12' E Corr.		16° 25' W
☽ 10	21 20		2 38		
☿ 11	20 12		0 59		
♀ 12	19 02		0 34 W		
♂ 13	17 45		2 17		
♀ 14	16 37		3 39		14 00
♂ 15	15 59		4 38		13 14
☉ 16	At five P M saw Barron-hill of St. Helena W N W half W distant fourteen or fifteen leagues. A M anchored in St. Helena Road Longitude observed at St. Helena 5° 19' W. Came to fail from St. Helena.				
at noon					
☽ 1	15 46	The Island bore S 44 E distance sixteen miles.			
☿ 2	14 24				
♀ 3	13 08	8° 38'	8 16	0° 22' E	
♂ 4	11 46		9 17		
♀ 5	10 31		11 18		12° 17'
♂ 6	9 12		12 49		11 50
☉ 7	7 53		14 09		10 20
☽ 8	5 58		14 59		
☿ 9	4 21		15 52		10 20
♀ 10	3 38		16 18		
♂ 11	2 53		16 34		10 04
♀ 12	2 23		16 44		
♂ 13	1 44		17 00		
☉ 14	1 11		17 10		
☽ 15	0 22	17 58	20 51	2 53 W	9 46
☿ 16	0 16 N	18 13	20 11	1 58	
♀ 17	1 27		20 40		8 29
♂ 18	2 25		21 24		
♀ 19	3 14		21 24		9 7

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Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation.
h 20	3° 26' N		21° 34' W Corr.		
☉ 21	3 59		20 41		
☽ 22	4 14		20 02		8° 20' W
♂ 23	4 32		19 46		9 24
♀ 24	5 04		19 20		
☿ 25	5 39		19 09		
♂ 26	6 17		19 20		
h 27	7 04		18 43		10 50
☉ 28	7 23	16 43	17 41 Corr.	0° 58' W	
☽ 29	7 50		18 20		11 29
♂ 30	8 34	17 46	18 59		
♀ 31	8 51	17 26	19 00 Corr.	1 34	10 50
☿ 32	9 11		18 33		
♂ 33	9 34		18 23		11 53
h 34	10 06		18 18		11 20
☉ 35	10 54		17 51		11 33
☽ 36	10 50		18 41		
♂ 37	10 52		19 33		12 03
♀ 38	11 05		20 34		10 30
☿ 39	11 42		21 44		
♂ 40	12 22		22 51		9 32
h 41	13 26		23 54		9 44
☉ 42	14 38	Saw Brava and Fuego			8 40
☽ 43	14 32	25 40	25 59 Corr.	0 19	8 45
♂ 44	15 52		27 02		
♀ 45	17 22		28 01		
☿ 46	19 14		28 48		
♂ 47	20 51		29 39		8 47
h 48	22 11		30 34		8 00
☉ 49	22 52		31 22		
☽ 50	23 08		31 57		8 28
♂ 51	23 03		31 55		7 27
♀ 52	23 17		32 09		
☿ 53	24 21		33 16		
♂ 54	25 42		34 00		8 22

A DAILY ASSISTANT FROM BOMBAY TOWARDS THE DOWNS.

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Weeks. Days.	Latitude in at Noon.	Longitud: by account at noon.	Longitude by ☉, ☽ or *. at Noon.	Difference	Variation
h 55	27° 09' N		34° 39' W Corr.		9° 13' W
☉ 56	28 22		35 05		9 49
☽ 57	28 43		35 01		
♂ 58	29 32		34 30		
♀ 59	29 42	34 17	35 10 Corr.	0° 53' W	
♂ 60	31 09	32 42	33 41	0 59	
♀ 61	31 43	31 39	33 01 Corr.	1 22	10 15
h 62	31 29		32 55		
☉ 63	31 21		32 55		11 05
☽ 64	31 21		32 55		
♂ 65	31 46		32 38		
♀ 66	32 19		31 43		11 44
♂ 67	32 26		31 30		
♀ 68	32 28		31 44		12 09
h 69	33 26		31 21		
☉ 70	33 30	29 52	31 41 Corr.	1 49	
☽ 71	34 11	29 11	30 29 Corr.	1 18	11 33
♂ 72	35 23	29 29	31		14
♀ 73	36 06		30 40		
♂ 74	37 18		29 17		15 25
♀ 75	38 10		28 37		15 19
h 76	39 44	At six P M saw Pico one of the Western Islands N 37° E distance eighteen leagues.			16 51
☉ 77	40 07				17 28
☽ 78	40 35				17 40
♂ 79	41 18				18
♀ 80	41 55				
♂ 81	42 36				18 40
♀ 82	43 50				
h 83	45 13				19 59
☉ 84	46 15				19 38
☽ 85	47 47				21 43
♂ 86	48 43			5 19	21 58
♀ 87	49 50			3 34	Spoke a
Swedish ship, who informed us, that the Start bore N W. di- tance eight or nine leagues.					
♀ 88	50 35		1 06		

Days.

A DAILY ASSISTANT FROM CHINA TOWARDS THE DOWNS.

1 I took a departure from the Great Ladron when it bore N b E three quarters E distance seven miles. I make it lay in latitude $21^{\circ} 57' N$, and in longitude $111^{\circ} 50' E$ from Greenwich.

We steered S b E, and at noon were in latitude $20^{\circ} 31' N$, and longitude $20' E$ from the Great Ladron.

2 Kept on the same course; at noon were in latitude $18^{\circ} 15' N$, and longitude $0^{\circ} 51' E$, from the Great Ladron.

3 Kept on the same course; at noon were in latitude $15^{\circ} 55' N$, and longitude $1^{\circ} 16' E$ from Great Ladron; we brought to and founded, and had forty two fathom, fine sand with pieces of rock. We then altered our course to S W b S.

N. B. By a ship from China in the year 1771, who had made $1^{\circ} 9' E$ longitude from the Great Ladron, and founding upon the Macclesfield Bank in nineteen fathom, his latitude at that time was by account $16^{\circ} 10' N$. It will be necessary to give the following remark as was taken from the Log book. Fresh gales, squally, hazy weather with the wind at N E b N. At eleven P M shortened sail, and at two A M brought to, intending to make Pulo Sap ta in the forenoon; at six ditto made sail, and at eight ditto was greatly alarmed

alarmed with the sight of a most dangerous shoal right ahead, which extended four or five miles E and W. It appearing to be clearest to the Eastward, we immediately put the ship about that way, but before we could clear it, we were entered a mile or more into the thick water that was washed by the sea from it, and in great doubt whether we should not be wrecked.

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Appendix.

But by the Providence of God got clear, we had two or three casts of the lead, but had no ground with twenty-nine fathom, and soon after brought to, and founded no ground with a hundred fathom; we perceived breakers on the shoal, but not very high, the water near them was of a thick reddish colour, occasioned by the ground being washed up by the sea. At noon had a very good observation, by which I found that we had been set 54' to the Southward of account by a strong current, which proves the shoal to be the Middleborough shoal, whose latitude is $9^{\circ} 02' N$. At noon we were in latitude $8^{\circ} 52' N$, and longitude by account $3^{\circ} 44' W$ from the Great Ladron.

4. N. B. I Hope that navigators will take notice of this remark. At noon we were in latitude $14^{\circ} 19'$, and longitude nine miles East of the Great Ladron.

We

A DAILY ASSISTANT FROM CHINA TOWARDS THE DOWNS.

- 5 We kept on the same course. At noon were in latitude $12^{\circ} 39' N$, and longitude $0^{\circ} 57' W$ from Great Ladron.
- 6 Our course was between S W b S, and S W. At noon were in latitude $11^{\circ} 00' N$, and longitude $2^{\circ} 43' W$ from Great Ladron.
- 7 At half past twelve P M we brought to and founded in fifty-six fathom. At three A M had ninety fathom; at noon were in latitude $9^{\circ} 33' N$, and longitude $3^{\circ} 50' W$ from the Great Ladron.
- 8 At noon were in latitude $8^{\circ} 20' N$, and longitude $7^{\circ} 20' W$ from the Great Ladron; we had then fourteen fathom water, brown sand, and specks with broken shells.
- 9 At noon were in latitude $5^{\circ} 28' N$, and longitude $7^{\circ} 59' W$.
- 10 At eight P M we founded and had forty-six fathom, gravel. At noon we were in latitude $3^{\circ} 11' N$, and longitude 8° from the Great Ladron.
- 11 At half past one saw Pulo Teman; the north part of it bore W distance four leagues. I judge it lays in latitude $3^{\circ} 04' N$. At six ditto saw Pulo Auroe bearing W b N, distance five leagues, were then in thirty-four fathom, soft mud. When Pulo Pisang bore

bore S W half W, distance four leagues. Pulo Auroe bore S half E. At noon we had twenty-five fathom, black and brown sand. I make the difference of longitude between Pulo Auroe and the Great Ladron 8° E from Pulo Sapata $4^{\circ} 03'$ E, and from Pulo Condero $1^{\circ} 55'$ E.

12 Saw the Seven Islands bearing S b W. and Pulo Taya W half N.

At noon were in latitude $1^{\circ} 07'$ N, the soundings this twenty-four hours were from twenty-two to fifteen fathom.

13 When the Seven Islands bore between E half N, and E b N half N, distance five leagues, we were then in fifteen fathom water. When Balacarang hill bore N W b N, and the Monopin hill E N E. and the low land of Sumatra West, distance four or five miles, we had from seven to ten fathom. When the third Point of Sumatra bore S E half E distance six or seven miles. The Monopin-hill bore N W in twelve fathom, red mud.

14 At noon were in latitude $1^{\circ} 55'$ S. and longitude $103^{\circ} 42'$ E from Greenwich.

15 At half past five PM Parmifang-hill, and third Point E S E half S. At six ditto Parmifang-hill E S E, and Monopin-hill N W half N. Nanka Island E three quarters S. Third

Days. A DAILY ASSISTANT FROM CHINA TOWARDS THE DOWNS.

Point of Sumatra S E half E, distance from the Sumatra shore four miles. At half past 10 A M saw Lucipara from the mast-head bearing S S E half E the first Point of Sumatra S S E half E distance two miles, depth of water fifteen fathom. In crossing over our foundings were as follows, viz. At two P M had from nine to thirteen. At four ditto, thirteen fathom; at six ditto, twelve, fifteen, twelve; at eight ditto, twelve and thirteen fathom; at ten ditto eighteen to twelve. At twelve ditto, twelve to fifteen and sixteen fathom. At seven A M sixteen to fifteen. At eight ditto seventeen to fifteen. At ten ditto thirteen to fourteen fathom. At noon five and six fathom.

16 At four P M Lucipara bore N b W distance four leagues; at six A M the extrems of Sumatra bore between W half N and W b S half S distance five leagues. At half past eleven ditto saw the Sisters from the mast-head, bearing S b W distance six leagues. At noon Sumatra bore between S W b W and W N W distance from shore two leagues, Latitude $4^{\circ} 46'$ S Our foundings were as follows, viz. At two P M five and a half and six fathom. At four ditto five fathom; at six ditto, seven, eight, and nine fathom; at eight ditto,

nine

Days.

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- nine, ten and twelve; at ten ditto, thirteen to twelve; at twelve ditto, nine ten and nine. At two A M nine, ten to thirteen. At four ditto, nine, eight, ten. At five ditto, three and a half to thirteen. At seven ditto, thirteen to twelve. At ten ditto, eleven, nine, and seven. At noon eleven, ten, and nine.
- 17 At four P M passed the Sisters to the Westward, distance two miles. At six they bore N E b N, and the extrems of the Sumatra shore between N N W half W, and S W half W, and the high land about Bantam Point bore between S half W to S half E, distance from the Sumatra shore six or seven miles.

At midnight the high land of Bantam Point bore S S E half E, and North Island S b W three quarters W. distance four miles. At four ditto, anchored at North Island in five fathom water, it bearing N N E half E, distance three miles. Bantam Point S E b E, the Body of Thwartway S three quarters E. Button S S E half E, the Northermost Brother S S W, the Watering place which is a little to the Southward of the southermost Cliff bearing S W b W, distance about two miles, the high land of Sumatra W b S half S.

Reference
to the
Appendix.

N. B. Took the Pinnace, and went round North Island. Between it and Sumatra is about a mile and a half broad; you have from six feet water upon the Sumatra shore, a clay and sandy bottom to twenty-four fathom, two-thirds of a cable length from North Island; then it shoaling again seventeen, fifteen, thirteen, ten, seven, and three fathom, a boat's length from the Beach. There is a small round rock like unto a Butt to the Southward of the Brothers, which being kept open with the Eastermost Brother a Sail's breadth, will lead you through in six or eight fathom.

There is a small reef off the East end of North Island; the tide that runs to the Southward makes high water.

Bearings taken in going out of the Narrows, or St. Joseph's Passage between Hog-Point and Thwartway. The SW end of Thwartway and the Strome Rock in one they will bear SSE half E; when at the distance of a quarter of a mile from the Eastermost Island on the Starboard hand we had twenty-eight and and thirty-two fathom, there was some appearance of a reef betwixt us and the shore.

When

When the S W end of Thwartway bore S S E half E; the above Eastern Island was in one with North Island. When the Strome Rock is in one with the East end of Thwartway, they bore E S E half S. At noon the Pick of Crokatoe and Long Island in one they bore S W half W to W three quarters N. distance seven or eight leagues, in thirty fathom water, latitude $6^{\circ} 19' S$; the extremes of Princes Island bore between S b W half W, and S b E half E, and the Pick of Crokatoe ENE half N.

Reference
to the
Appendix.

When the West Point of Princes Island and Java-head were in one they bore S S E, half E, distance from the Point three miles, and the Head twenty-four miles.

Before I take my departure from this part of the world, I think it necessary to give some remarks, concerning the winds and seasons, in and about the China Seas.

Along

Reference
to the
Appendix.

Along the South Side of Java from Princes Island, to, and beyond the Straits of Allas.	{	Variable -	November
			December
		Strong Westerly -	January
		Wind and Rain -	February
			March
		Fair and Variable -	April
		Begins Easterly -	May
			June
		Fair and Easterly Winds.	July
			August
		Variable -	September
			October

N. B. The Current sets with the winds. The north side of Java the same as the South side. You may sail through the Straits of Sunda all times in the year, to and from Batavia, but the best times to go up them are in May, June, July, and August, and down them in December, January, and February; but in March and April, you will have mostly calms, and very light airs with a current setting down the Straits.

The

A DAILY ASSISTANT FROM CHINA TOWARDS THE DOWNS.

III

The Straits of Banca can be sailed through at any time; but the proper time is to go up them from April to September, and to go down them from China from October to March.

Reference
to the
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From

Reference
to the
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From the Equinoctial to the Coasts of China.

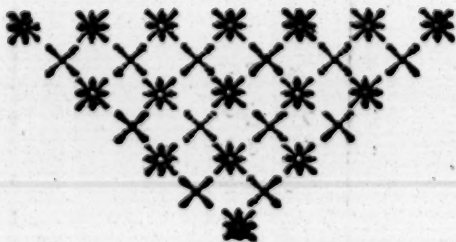
The N E Monsoon from October to March.

The S W Monsoon from May to September.

Straits Malacca

May be failed either up or down, any time of the year. You may fail to Bencoolen at any time.

Along the South side of Sumatra, the same as Java, only the Westerly Monsoon inclines to the Northward, and the Easterly to the Southward.



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Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or * at Noon.	Difference.	Variation.
♂ 1	Took a departure from Java-head, allowing it to lay in 6° 52' S 103° 56' E from Greenwich.				
at noon.	7 48				
♀ 2	8 56				
♂ 3	10 30				
♀ 4	11 50				
♂ 5	13 25		105 11	Corr.	
♀ 6	15 00		104 12		
♂ 7	16 02		101 30		
♀ 8	15 52		99 04		
♂ 9	15 52		97 11		
♀ 10	15 47		96 37		
♂ 11	15 58		95 39		
♀ 12	16 34		93 51		
♂ 13	17 09		92 18		
♀ 14	17 52		90 02		
♂ 15	18 23		87 24		2° 40' W
♀ 16	18 53		83 33	Corr.	
♂ 17	19 13		82 25		3 15
♀ 18	19 20		80 43		
♂ 19	19 59		79 05		
♀ 20	20 49		76 21		
♂ 21	21 07		73 42	Corr.	6 08
♀ 22	21 27		71 24	Corr.	
♂ 23	21 40		68 55	Corr.	7 50
♀ 24	22 10		65 50		9 13
♂ 25	22 48		63		
♀ 26	23 53		60 02		14 50
♂ 27	25 08		57 14		
♀ 28	26		54 25		
♂ 29	26 59		52 30		19
♀ 30	27 55		52 13		20 47
♂ 31	28 10		50 32		
♀ 32	28 30		49 12		

A DAILY ASSISTANT FROM CHINA TOWARDS THE DOWNS.

Reference
to the
Appendix

Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or ♀. at Noon.	Difference	Variation.
h 33	29° 10' S		46° 18' E Corr.		
☉ 34	29 15		43 34 Corr.		25° 00' W
☽ 35	30 42		41 23		
♂ 36	31 16		39 05		
♀ 37	31 47		37 47		26
♂ 38	32 28		35 01		
♀ 39	33 04		32 34		25
h 40	33 54		30 52		25 13
☉ 41	35 01		27 28		24
☽ 42	35 04		26 42		23 50
♂ 43	35 23		25 57		
♀ 44	35 56		22 16 Corr.		22 30
♂ 45	35 14		21 22		21 27
At noon saw the land off the deck bearing N half W to N b E half E ten or twelve leagues.					
☉ 48	33 58		bore away.		
☽ 49	32 42		17 00 Corr.		19 30
♂ 50	31 36		15 31		
♀ 51	29 50		12 29 Corr.		18 30
♂ 52	27 59		10 03		17 40
♀ 53	26 27		7 55		17 00
h 54	24 53		5 55		16 15
☉ 55	23 16		3 57		
☽ 56	21 51		2 09		
♂ 57	20 26		1 Corr.		14
♀ 58	19 01		0 23 W		
♂ 59	17 37		1 47		
♀ 60	16 31		3 22 Corr.		13 30
h 61	15 59		5 14		12 30
Saw St. Helena W b N five or six leagues Took a departure from Ditto.					
☉ 1	15 04		6 43		
☽ 2	13 42		8 11		

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Weeks. Days.	Latitude in at Noon.	Longitude by account at noon.	Longitude by ☉, ☽ or ♀, at noon.	Difference	Variation.
♂ 3	12° 06' S		9° 45' W Corr.		
♀ 4	10 39		11 35		
♂ 5	9 19		13 24 Corr.		10° 10' W
♀ 6	8 12		14 48 Corr.		
The Island of Ascension in sight.					
h 7	6 25		16 06		9 30
☉ 8	4 35		17 16		
☽ 9	3		18 20		8 30
♂ 10	1 29		19 21		
♀ 11	09		20 10		8
h 12	0 41 N		20 44		
♀ 13	1 36		21 17		
h 14	2 57		21 44		7
☉ 15	4 33		24 38 Corr.		6 30
☽ 16	5 36		24 52		
♂ 17	6 06		25 08 Corr.		
♀ 18	6 57		25 30		
♂ 19	7 44		25 44		
♀ 20	8 41		26 32		
h 21	9 32		27 51		
☉ 22	10 42		28 52 Corr.		5 10
☽ 23	11 59		30 35 Corr.		5 30
♂ 24	13 32		32 08		
♀ 25	15 15		33 16		
♂ 26	16 56		34 15		
♀ 27	18 35		35		
h 28	19 57		36 13 Corr.		
☉ 29	21 05		37 30 Corr.		4 20
☽ 30	21 54		38 30 Corr.		4 15
♂ 31	22 50		39 13 Corr.		5 10
♀ 32	23 30		39 49 Corr.		4 40
♂ 33	24 50		40 22 Corr.		4
♀ 34	26 20		40 29 Corr.		5
h 35	27 46		40 43 Corr.		5 15

A DAILY ASSISTANT FROM CHINA TOWARDS THE DOWNS.

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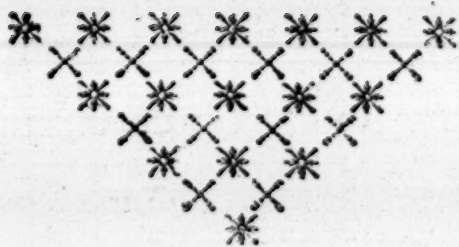
Weeks. Days.	Latitude in at Noon.	Longitude by account at Noon.	Longitude by ☉, ☽ or ♀. at Noon.	Difference	Variation.
☉ 36	28° 50' N		40° 50' W		
☽ 37	29 36		41 41		8° 00' W
♀ 38	31 06		42 13		
☽ 39	32 06		42 11		8 50
☽ 40	32 54		42 14		9
♀ 41	34 28		41 52		9 00
☉ 42	36 19		41		10
☽ 43	38 04		39 37		11 40
☽ 44	38 55		38 52	Corr.	13 30
♀ 45	39 19		37 38		14
☽ 46	39 38		35 25	Corr.	
☽ 47	40 09		32 46		
♀ 48	40 44		29 56	Corr.	17 00
Island of Corvo in sight					
☽ 49	41 22		27 28		
☉ 50	41 19		25 39	Corr.	18
☽ 51	41 20		25 17	Corr.	18 30
♀ 52	41 43		26 09	Corr.	
☽ 53	42 38		25 09		
☽ 54	44 01		23 42		
♀ 55	46 02		20 56	Corr.	
☽ 56	47 01		19 43		
☉ 57	48 01		18 34	Corr.	
☽ 58	48 26		16 50		22
♀ 59	48 38		16		
☽ 60	49 0		14 15		
☽ 61	49 23		10 49		
♀ 62	49 35		8 18		
☽ 63	49 40				
At Noon Lizard bore ENE half N, and the Land's end N half E. distance from shore nine leagues.					

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At noon the two churches N b E one quarter E, and N b E half E, distance from Land's-end nine leagues, by taking the mean of my own observations; the Longitude is $5^{\circ} 23' W$, and by the bearing of the Lizard is but eight miles in Longitude less than it should be, which is only five nautical miles, and the mean of all the observations differs only from its true position ten and a half nautical miles, or sixteen miles in longitude.

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Direc.

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Directions necessary to be observed in coming into the English Channel.

In coming out of the Ocean into Soundings, you must know that there is a Bank before you come in upon regular sounding (which I myself found by woeful experience.) We had ninety fathom water, and were forced in a gale of wind to run for the Channel, and after I run between seventy and seventy-five leagues, I thought I should be nearer to the Caskets than the English shore, and by hawling up to the Northward to avoid that danger, I fell in with the Lizard Lights; but unfortunately for me it was when the Two Lights were erected, and the workmen being employed in a temporary house, and having a light in it, we supposed them to be three proper lights, so we took the wrong side and hauled into Mount's Bay, and there I lost my ship which was

not

not infured. When you come upon foundings, you may know by the water being discoloured; your best help is a good observation of the latitude and longitude if you can get them; but by all the journals that I saw before this new method was practised, I find they fell in by their accounts six degrees or more to the Westward, in coming from St. Helena to England. And I am well assured that if the distance of the $\odot$ and $\sphericalangle$ is taken with tolerable care with the instruments that are now in use, they need not be thirty miles out.

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If we have not those helps, we must do as well as we can. Therefore the next consideration is the depth of water with the colour and quality of the ground, which is but uncertain; but in general it is observed, that the ground to the Southward on the French Coast is more gruff, i. e. the sand is bigger or more gravelly; bigger shells and more variety, with a sort of small sharp things called needles.

WSW from Ushant, distance eight or ten leagues, you will have seventy-four or seventy-five fathom water.

And

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And W from Ushant four or five leagues, you will have sixty-eight or seventy fathom.

W N W from Ushant eight or ten leagues, you will have seventy or seventy-one fathom.

And four, five, or six leagues, you will have sixty-five and sixty-six fathom in the same bearings. N W from Ushant eight or ten leagues, you will have seventy fathom, and five leagues, sixty-four fathom.

N N W from Ushant about eight or ten leagues, you will have sixty-five to sixty-eight fathom, and four leagues distance the same bearings sixty fathom. North from Ushant eight or ten leagues sixty-four and sixty-five fathom, and three leagues you will have sixty fathom.

In the foregoing bearings and distance from Ushant, the ground produces white things like hake's-teeth, and the ground gruffer than on the English Coast ; for on the Coast of England the ground

is

is finer in general. When you are to the Southward of Scilly, five, six, or seven leagues distance, you will have from fifty-five to sixty fathom water, fine white sand, with some red and black amongst it, and sometimes small shells or pieces of shells, and at other times white sand only. Keep in the latitude of $49^{\circ} 30'$ till you have from sixty to sixty-five fathom water more or less as the tides may rise or fall. At Scilly and thereabouts, the tide riseth about three fathom at full and change of the moon. The Light-house may be seen in the Latitude of $49^{\circ} 35'$.

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When the Light-house bore N and N b E distance about six or seven leagues, then we had fifty-eight fathom, fine sand, with black specks and pieces of shells; to the Westward of Scilly the ground is fine gray sand, and white sand mixed with small black sand and pieces of shells.

But if you are to the Northward of Scilly, then your ground will be white oazy sand. When the Head of Scilly bears S

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distance five or six leagues, you will have from fifty-three to fifty-seven fathom water, you may then see the Lights of Scilly in a clear night seven leagues.

Many ships have fallen in to the Northward of Scilly into the Welch or Severn Channel, contrary to their expectations; the course of which is by a stream, setting nine hours from the NW, to NE, and but three hours to the Southward. This stream begins to set NW when it is half ebb at Scilly, and endeth in the North East, when it is high water at ditto.

It commences about six or seven leagues to the Westward of Scilly, and four or five leagues to the Southward of Scilly, and so between it and the Lizard.

Being to the Southward of Scilly, about the Latitude of $49^{\circ} 30'$, and having between sixty and fifty-five fathom water, you may keep away East in that Latitude, according as you have wind and weather; but when you have sailed about fifteen

or

or twenty leagues and have from fixty to fifty-five and fifty-two fathom; then if the weather be clear, you may steer northerly to make the Land.

When the Lizard bears N b E about nine leagues, you will have fifty-five and fifty-seven fathom; then you will have pieces of shells of several colours with thin small flaty stones, and no sand, and meeting with this ground, you may stand to the Northward into forty fathom.

Being past the Lizard, if you keep without forty fathom, you need not fear the Eddy Stone, you will have forty fathom in the stream of it, and if you keep within thirty-five fathom it will carry you within the Eddy Stone.

Being sure you are past the Lizard, take care to keep off from the French shore, for fear of the Rocks called Caskets; for when you are near them, the tide of flood sets strong in amongst the

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Islands of Guernsey and Jersey. You will have deeper water when you are near these rocks, and the ground gruffer than on the English Coast. You may from the Start to Portland, and the Isle of Wight, keep between forty and thirty fathom, according as you advance up the channel.

When you come near the Isle of Wight, have a care of the Indraught that sets strong into the Needles and St. Helena. You may consult the outward-bound directions.

N. B. If you should stand over towards the French Coast, there is a bank in the fair way between Dungenness and Bologne Bay, which hath but thirteen fathom on it, which if you found upon in the night, may cause you to think that you are nearer the shore than you are.

I now conclude with declaring that the remarks and directions in the East-Indies are taken from the Journals of able and experienced Gentlemen in the service of the Company, and

I shall

I shall always be thankful for any information which may tend to the safety of Navigation, and will correct any errors in this work, as soon as I am made acquainted with them.

Reference
to the
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It is incumbent in me in a particular manner to acknowledge that the most interesting parts of the foregoing work are taken from the journals of the following gentlemen, viz.

Capt. CHARLES MEARS, Capt. JOHN LAUDER,
Capt. ROBERT KER, and Capt. ROBERT SCOTT.

And I doubt not that the gentlemen in the service in general will deserve well of their country by their useful remarks in future; it will always be a great pleasure to me to do their names justice in my next impressions.

F I N I S.



